

No. 2025-____

United States Court of Appeals
for the Federal Circuit

IN RE QUALCOMM INCORPORATED,
Petitioner

On Petition for Writ of Mandamus to the
United States District Court for the
Western District of Texas
Case No. 6:21-cv-00346-ADA, Hon. Alan D Albright

**NONCONFIDENTIAL APPENDIX IN SUPPORT OF
PETITION FOR WRIT OF MANDAMUS**

MARCH 19, 2025

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CONFIDENTIAL STATEMENT

Portions of Appx0002-Appx0027, Appx0133-Appx0158, Appx0133-Appx0158, and Appx1118-Appx1165 have been omitted from the non-confidential version of the Appendix, pursuant to the District Court's Amended Standing Order Regarding Filing Documents Under Seal and Redacted Public Versions. The omitted portions contain Petitioner's confidential business information and/or confidential financial information. Appx0159-Appx1117 and Appx1166-Appx1540 are confidential materials filed under seal in their entirety, with no redacted/public counter-part, pursuant to the District Court's Amended Standing Order Regarding Filing Documents Under Seal and Redacted Public Versions. These materials likewise contain Petitioner's confidential business information and/or confidential financial information.

March 07, 2022

CLERK, U.S. DISTRICT COURT
WESTERN DISTRICT OF TEXAS**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION**BY: Reuben Amaro
DEPUTY**AMENDED STANDING ORDER REGARDING
FILING DOCUMENTS UNDER SEAL AND REDACTED PUBLIC VERSIONS**

This Order applies to all patent cases pending before the undersigned. As a public forum, the Court has a policy of providing to the public full access to documents filed with the Court. Because parties in patent cases routinely file confidential information, this Order grants leave for any party to file materials containing confidential information under seal. Parties need not file a separate motion for leave.

The filing party shall file a publicly available, redacted version of any motion or pleading filed under seal within seven days. The parties need not file redacted versions of exhibits to such documents. Exhibits that are nonconfidential in their entirety should not be filed under seal at all. The parties shall coordinate to make sure that the publicly available version redacts information that any party deems confidential. Redactions should be targeted to redact only that information. The publicly available version shall be labeled "PUBLIC VERSION." Cooperating to file the publicly available version shall not be deemed as agreeing that the redacted information is confidential.

The Court will enter a sealed order to resolve a motion if either party filed its briefing under seal. The movant shall email a redacted version of the Court's sealed order for publication within seven days after the Court enters the sealed order. The movant shall email the redacted, public version to the Court's law clerk (txwdml_lawclerks_wa_judgealbright@txwd.uscourts.gov).

SIGNED this 7th day of March, 2022.


ALAN D ALBRIGHT
UNITED STATES DISTRICT JUDGE

UNITED STATES DISTRICT COURT FOR
THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

RED ROCK ANALYTICS LLC,

Plaintiff,

v.

APPLE INC., QUALCOMM INC.,

Defendant.

Case No. 6:21-cv-00346-ADA

REDACTED PUBLIC VERSION

ORDER DENYING MOTION TO TRANSFER VENUE

I) SUMMARY

After careful consideration of the parties' briefing, the relevant facts, and the applicable law, this case would not be clearly more convenient to try in the Northern District of California. **THEREFORE, IT IS ORDERED** that the Defendant's Motion to Transfer Venue is **DENIED**.

II) BACKGROUND

A. PROCEDURAL HISTORY

Red Rock Analytics, LLC [hereinafter "Red rock"] filed its complaint on April 8, 2021. ECF No. 1. The complaint alleges patent infringement by the Defendants in this case, Apple Inc. [hereinafter "Apple"] and Qualcomm, Inc [hereinafter "Qualcomm"]. *Id.* Apple filed a Motion to Dismiss on June 17, 2021. ECF No. 18. Qualcomm answered the complaint on June 17, 2021. ECF No. 19. Defendants Qualcomm and Apple filed a Motion to Transfer on August 24, 2021. ECF No. 45. Plaintiff Red Rock opposed the motion and filed a response in opposition on January 14, 2022. ECF No. 73. Defendants Qualcomm and Apple replied to Red Rock's

opposition on March 4, 2022. ECF No. 101. Plaintiff Red Rock filed a sur-Reply in opposition to Defendants' Motion to Transfer on March 31, 2022. ECF No. 109. Defendants Qualcomm and Apple filed a sur-sur-Reply to Red Rock's opposition on April 14, 2022. ECF No. 112.

Red Rock also filed a first Notice of Supplemental Authority on November 30, 2022. ECF No. 136. Defendants Qualcomm and Apple filed a response to Red Rock's motion for leave to file supplemental briefing on December 15, 2022. ECF No. 141. Red rock filed a second supplemental brief on April 18, 2023. ECF No. 153. Defendants Qualcomm and Apple filed a response to Red Rock's second supplemental brief on April 28, 2023. ECF No. 154. Red Rock filed a third supplemental brief on March 1, 2024. ECF No. 159. Red Rock filed a fourth supplemental brief on March 15, 2024. ECF No. 162. Defendants Qualcomm and Apple filed a response and corrected response to Red Rock's third and fourth supplemental brief on March 15, 2024. ECF No. 163. Red Rock Red Rock filed a fifth supplemental brief on September 16, 2024. ECF No. 166. Defendants Qualcomm and Apple filed a response to Red Rock's fifth supplemental brief on September 27, 2024. ECF No. 168.

B. REQUESTED RELIEF

Red rock exercised their right as the plaintiff in selecting the Western District of Texas as an appropriate venue. Qualcomm and Apple asserts that the Northern District of California [hereinafter "NDCA"] would be a clearly more convenient venue than the Western District of Texas [hereinafter "WDTX"]. Accordingly, Apple requests that under 28 U.S.C. § 1404(a) this case be transferred to NDCA.

III) LEGAL OVERVIEW

In patent cases, motions to transfer under 28 U.S.C. § 1404(a) are governed by the law of the regional circuit—here, the Fifth Circuit. *In re TS Tech USA Corp.*, 551 F.3d 1315, 1319 (Fed. Cir. 2008). 28 U.S.C. § 1404(a) provides in part that “[f]or the convenience of parties and witnesses, . . . a district court may transfer any civil action to any other district or division where it might have been brought . . .” *Id.* “Section 1404(a) is intended to place discretion in the district court to adjudicate motions for transfer according to an ‘individualized, case-by-case consideration of convenience and fairness.’” *Stewart Org., Inc. v. Ricoh Corp.*, 487 U.S. 22, 29 (1988) (quoting *Van Dusen v. Barrack*, 376 U.S. 612, 622 (1964)).

The preliminary question under § 1404(a) is whether a civil action “‘might have been brought’ in the destination venue.” *In re Volkswagen, Inc.*, 545 F.3d 304, 312 (5th Cir. 2008) [hereafter *Volkswagen II*]. If the destination venue would have been a proper venue, then “[t]he determination of ‘convenience’ turns on a number of public and private interest factors, none of which can be said to be of dispositive weight.” *Action Indus., Inc. v. U.S. Fid. & Guar. Co.*, 358 F.3d 337, 340 (5th Cir. 2004) (footnote omitted). The private interest factors include: “(1) the relative ease of access to sources of proof; (2) the availability of compulsory process to secure the attendance of witnesses; (3) the cost of attendance for willing witnesses; and (4) all other practical problems that make trial of a case easy, expeditious and inexpensive.” *In re Volkswagen AG*, 371 F.3d 201, 203 (5th Cir. 2004) [hereinafter *Volkswagen I*] (citing *Piper Aircraft Co. v. Reyno*, 454 U.S. 235, 241 n.6 (1982)). The public factors include: “(1) the administrative difficulties flowing from court congestion; (2) the local interest in having localized interests decided at home; (3) the familiarity of the forum with the law that will govern the case; and (4)

the avoidance of unnecessary problems of conflict of laws of the application of foreign law.” *Id.* Courts evaluate these factors based on the situation which existed at the time of filing, rather than relying on hindsight knowledge of the defendant’s forum preference. *Hoffman v. Blaski*, 363 U.S. 335, 343 (1960).

The moving party has the burden to prove that a case should be transferred for convenience. *Volkswagen II*, 545 F.3d at 314. The burden is not simply that the alternative venue is more convenient, but that it is **clearly** more convenient. *Id.* at 314–15. This is because “the Court must give some weight to the plaintiffs’ choice of forum.” *In re Chamber of Com. of United States of Am.*, 105 F.4th 297, 302 (5th Cir. 2024) (citing *Atl. Marine Const. Co. v. U.S. Dist. Ct. for W. Dist. of Tex.*, 571 U.S. 49, 62 n.6, 134 S.Ct. 568, 187 L.Ed.2d 487 (2013)). While “clearly more convenient” is not the same as the “clear and convincing” standard, the moving party must still show more than a mere preponderance. *Quest NetTech Corp. v. Apple, Inc.*, No. 2:19-cv-118, 2019 WL 6344267, at *7 (E.D. Tex. Nov. 27, 2019). In addition, the “movant must show (1) that the marginal gain in convenience will be significant, and (2) that its evidence makes it plainly obvious—i.e., clearly demonstrated—that those marginal gains will actually materialize in the transferee venue.” *In re Clarke*, No. 24-50079, 2024 WL 886953, at *2 (5th Cir. Mar. 1, 2024) (emphases in original). Yet, the Federal Circuit has clarified that, for a court to hold that a factor favors transfer, the movant need not show any individual factor clearly favors transfer. *In re Apple Inc.*, 979 F.3d 1332, 1340 (Fed. Cir. 2020).

IV) ANALYSIS

A. PROPER VENUE AND JURISDICTION IN TRANSFER VENUE

As an initial step before further considering the transfer for convenience, Qualcomm and Apple must show that both venue and jurisdiction would have been proper in the proposed transferee forum, here the NDCA. Apple has satisfied this burden by showing that it is headquartered in the NDCA. ECF No. 45 at 6. Qualcomm has satisfied this burden by showing it has multiple offices located in NDCA, including locations in Santa Clara and San Jose. *Id.*

B. PRIVATE INTEREST FACTORS

1. The Cost of Attendance and Convenience for Willing Witnesses

i. Legal Overview

The most important factor in the transfer analysis is the convenience of the witnesses. *In re Genentech, Inc.*, 566 F.3d 1338, 1342 (Fed. Cir. 2009). According to Fifth Circuit law, if the distance between a current venue and a proposed venue is more than 100 miles, the inconvenience to witnesses increases in direct relationship to the additional distance they must travel if the matter is transferred. *Volkswagen II*, 545 F.3d at 317. However, it is unclear when the 100-mile rule applies, as the Federal Circuit has stated that courts should not apply the rule “rigidly” in cases where witnesses would be required to travel a significant distance no matter what venue they testify in. *In re Apple*, 979 F.3d at 1342 (discussing witnesses traveling from New York) (citing *Volkswagen II*, 545 F.3d at 317); *In re Genentech, Inc.*, 566 F.3d 1338, 1345 Fed. Cir. 2009 (finding that little weight should be given when regardless the witnesses “will be traveling a great distance no matter which venue the case is tried in.”). Instead, “the inquiry should focus on the cost and inconvenience imposed on the witnesses by requiring them to travel to a distant forum and to be away from their homes and work for an extended period of time.” *In re Google, LLC*, No. 2021-170, 2021 WL 4427899, at *4 (Fed. Cir. Sept. 27, 2021). According to

the Federal Circuit, time is weighed more heavily as a metric than distance. *Id.* However, as noted above, the Federal Circuit has held that when willing witnesses will have to travel a significant distance to either forum, the slight inconvenience of one forum in comparison to the other should not weigh heavily on the outcome of this factor. *In re Apple*, 979 F.3d at 1342.

ii. Qualcomm and Apple's Arguments

Qualcomm and Apple argue the relevant witnesses are primarily in NDCA, or at least in California, and that a trial there would be more convenient for those witnesses. ECF No. 45 at 6. Defendants also argue that none of the possible witnesses in WDTX are responsible for the Accused Functionality in the Accused Products. *Id.* at 7.

Defendants argue that, because Apple is headquartered in Cupertino, California, the relevant witnesses from Apple would be in NDCA. *Id.* This includes witnesses with knowledge related to both the technical and financial operations of Apple and, specifically, the Accused Apple Products. *Id.* Further, Apple's witnesses responsible for [REDACTED] [REDACTED]. ECF No. 101 at 24–25.

Several of Apple's potential marketing, licensing, and finance witnesses are said to be in NDCA. ECF No. 45 at 8. This includes one of Apple's Senior Finance Managers, Mark Rollins, and his team. *Id.* Defendants argue Mr. Rollins would be the best at providing financial information, since Mr. Rollins [REDACTED]. ECF No. 101 at 18. [REDACTED]. *Id.* Potential marketing and financial witnesses located in WDTX have limited or non-applicable information. *Id.* at 21–24. Even if individuals in WDTX do have access to relevant information, Defendants

argue witnesses in NDCA (such as Mr. Rollins) have better access to all potentially relevant information. ECF No. 112 at 9.

Defendants argue none of the potential witnesses Red Rock identified within WDTX have the relevant knowledge. Specifically, Apple's technical employees in Austin are said not to work on the accused products or on I-Q calibration. *Id.* at 8. According to Defendants, [REDACTED]. ECF No. 101 at 25. Defendants also assert Red Rock's statements regarding Austin employees of Apple who do have knowledge of I-Q calibration are irrelevant, since the knowledge of those employees is speculative or outdated. *Id.* at 18–20.

Defendants also point to the large percentage of Qualcomm's U.S. based employees residing in California. ECF No. 45 at 6. Qualcomm argues a majority of the team members responsible for [REDACTED]

[REDACTED] are based in NDCA. *Id.*

Defendants also assert the potential technical witnesses in Texas [REDACTED]. ECF No. 101 at 21. Defendants argue the [REDACTED] identified by Red Rock aren't relevant since the claims at issue recite "conventional hardware." ECF No. 112 at 6. Therefore, the [REDACTED] are only tangentially relevant. *Id.* Defendants assert any potential witnesses who do work related to I-Q calibration were [REDACTED]. ECF No. 101 at 22–24. Defendants further state and potential [REDACTED] identified by Red Rock wouldn't have the relevant information related to the claimed technology. ECF No. 101 at 19.

For Red Rock's key witness in Florida, Qualcomm and Apple argue the differences between the venues are *de minimis*. *Id.* at 31. Defendants also argue it is more convenient for the Plaintiff's consultant in San Diego, California to attend trial in NDCA than in WDTX. *Id.* at 32. The two likely witnesses from Red Rock are located in Florida and SDCA, which Qualcomm and Apple argues makes the inconvenience of each forum relatively equivalent or favoring transfer. Defendants further argue that a consultant for a defendant "should not be given similar weight to that of a party witness. *Id.* Defendants further assert there are multiple named inventors on prior art patents, patent applications, and papers relevant to the technology at issue who are in NDCA and who could be witnesses. ECF No. 45 at 9–10.

iii. Red Rock's Arguments

Red Rock responds by pointing out potential shortcomings in Defendants' description of affected witnesses. ECF No. 73 at 12. Red Rock points out that Defendants ignore several teams who developed related hardware in Texas. *Id.* This includes [REDACTED] [REDACTED]. *Id.* at 19. There are also other potential Texas-based witnesses employed by Apple who [REDACTED] [REDACTED]. *Id.* at 19–20. Red Rock further argues that several of Apple's teams with information relevant to damages, such as [REDACTED] [REDACTED] [REDACTED]. ECF No. 109 at 14.

Red Rock represents that Qualcomm has several potential technical witnesses in WDTX or in Richardson, TX. ECF No. 73 at 20. This includes Qualcomm's [REDACTED]

[REDACTED]. *Id.* At least one Texas-based employee is asserted to [REDACTED]. ECF No. 109 at 17. Red Rock argues there are also several potential Qualcomm damages witnesses in or near WDTX. ECF No. 73 at 22. Red Rock further argues the limitation placed by Qualcomm in that potential sales and marketing witnesses need knowledge of I-Q gain calibration technology, is undue as the non-technical Qualcomm witnesses in NDCA (put forth by Defendants) do not have knowledge of I-Q gain calibration technology. ECF No. 109 at 16.

Red Rock represents their own witnesses are less inconvenienced by a trial in WDTX than in NDCA. Red Rock asserts the inventor of the Asserted Patent is located in Florida, which is closer to WDTX than NDCA. ECF No. 73 at 22. Red Rock's consultant, Jeffrey Rischer, lives in San Diego, but has also stated it is more convenient for him to travel to WDTX for trial. *Id.*

Red Rock also argues the inventors of Defendant's proposed prior art and authors of related papers are irrelevant as witnesses. ECF No. 109 at 18.

iv. Analysis

The Court finds that this factor is ultimately neutral. Both parties point to a variety of possible witnesses who may serve roles within this lawsuit. While the Defendants point to witnesses with a greater amount of knowledge related to the Accused Product's I-Q calibration, Red Rock has shown several potential witnesses with relevant knowledge of the claimed hardware. Both Red Rock and the Defendants have provided numerous potential witnesses for consideration, many with varying degrees of relevance. However, this analysis should not consist of stacking the scale with as many potentially frivolous witnesses as is possible to venue shop for

either party. The question can be simply framed as “what is the cost of attendance for willing witnesses that are likely to appear at trial?”

Red Rock’s Florida witness does not weigh heavily on the outcome of this factor, as there are largely insignificant differences in both time and distance for the witness to travel. *See In re Apple*, 979 F.3d at 1342. At most, WDTX appears to be marginally closer and quicker for these witnesses.

Apple’s Cupertino witnesses would clearly be better served with the trial being held in NDCA. However, Apple does possess a campus in Austin which could help to mitigate interruptions to their workflow and, as a result, would reduce the cost of attendance for these witnesses. Qualcomm’s California-based witnesses would also likely be better served if the trial was held in NDCA. However, the relevant witnesses for Qualcomm appear split between NDCA and San Diego. Any witnesses from San Diego would still be required to travel to NDCA for trial. Further, Qualcomm also has a facility in Austin to mitigate interruptions in workflow and reduce the cost of attendance for Qualcomm’s witnesses. The presence of a place where Defendants’ witnesses can conduct work is directly related to the cost of their attendance. *In re Google, LLC*, No. 2021-170, 2021 WL 4427899, at *4 (Fed. Cir. Sept. 27, 2021) (“the inquiry should focus on the cost and inconvenience imposed on the witnesses by requiring them to travel to a distant forum and to be away from their homes **and work** for an extended period of time.”) (emphasis added). Simply put, it is not dispositive and does not carry weight in this analysis if a corporation solely has a large presence in any venue without more information about what that presence entails. However, having a reliable location to work from which is near a prospective venue would help mitigate the cost of attendance for witnesses. While the Defendants point to

time away from family for witnesses in NDCA and San Diego, common sense again rears its head. A major corporation intending to call a witness for a patent trial is likely to have taken that witness away from their family for several days to ready them for trial. The reality of modern patent trials often includes a week or more of witness preparation, regardless of if the Courthouse is nearby. Witnesses are unlikely to be driving in from home, testifying, and driving back (let alone flying to and from San Diego as argued by Defendants). Simply put, there will be some baseline cost to any witness that may be called to trial. While this may be somewhat mitigated by a trial closer to home, this Court finds it unlikely that the discrepancy is so great that the trial witnesses are only likely to lose time with family when traveling to WDTX. This reality of what willing witnesses are likely to face must be considered when weighing the cost of attendance in different venues and it mitigates some of the cost reductions that will be realized by a witness in an otherwise closer venue. Regardless of that reality, the Defendants have not presented any strong indications for why each of these witnesses are likely to appear in this trial. This severely reduces the weight that many of the witnesses in Cupertino, or elsewhere in California, carry for consideration of this factor.

The location of Red Rock's sole employee and inventor of the Asserted Patent is neutral. It is also largely immaterial that Red Rock's consultant is in San Diego and would be reviewing documents with Red Rock's attorneys in Texas. That just makes him a willing witness. The remainder of the analysis is the time and distance between the venues and the cost that will be imposed on the witnesses. This is not guided by preference but by the geographical constraints imposed by having a trial in the different proposed venues. NDCA is closer to San Diego, but

Florida is closer to WDTX by both distance and travel time. These competing interests result in a net neutral for the two key Red Rock witnesses.

As is clear from the briefing by both Red Rock and Defendants, there are members of both Apple's and Qualcomm's teams with relevant knowledge in both proposed venues. The Court finds that both venues contain witnesses with specialized knowledge not found in the other venue. For instance, there are several NDCA witnesses—[REDACTED]—with specialized knowledge that witnesses found in WDTX do not seem to possess. Ultimately, with the balance being nearly equal, and the uncertainty surrounding which witnesses are likely to actually appear at trial, this Court has determined that this factor is neutral.

2. The Relative Ease of Access to Sources of Proof

i. Legal Overview

“In considering the relative ease of access to proof, a court looks to where documentary evidence, such as documents and physical evidence, is stored.” *Fintiv Inc. v. Apple Inc.*, No. 6:18-cv-00372, 2019 WL 4743678, at *2 (W.D. Tex. Sept. 10, 2019). “[T]he question is *relative* ease of access, not *absolute* ease of access.” *In re Radmax*, 720 F.3d 285, 288 (5th Cir. 2013) (emphases in original). “[W]hile electronic storage of documents makes them more widely accessible than was true in the past, that does not make the sources-of-proof factor irrelevant.” *In re Juniper Networks, Inc.*, 14 F.4th 1313, 1321 (Fed. Cir. 2021) (citing *Volkswagen II*, 545 F.3d at 316). The Court acknowledges that the Fifth Circuit's decision in *In re Planned Parenthood* indicates a shift in the analysis of this factor. The Fifth Circuit has recently agreed with a district court that concluded that this factor is neutral because electronic evidence is equally accessible in either

forum. *In re Planned Parenthood Fed’n of Am., Inc.*, 52 F.4th 625, 630 (5th Cir. 2022). The Fifth Circuit held that “[t]he location of evidence bears much more strongly on the transfer analysis when . . . the evidence is physical in nature.” *Id.* But the Federal Circuit has held that it is an error to conclude this factor is neutral only because electronic documents are easily accessible in both forums. *In re Apple, Inc.*, No. 2022-128, 2022 WL 1196768, at *4 (Fed. Cir. Apr. 22, 2022). To the extent that these two holdings can be reconciled, the Court concludes that the location of physical evidence is more important to this analysis than the location of where electronic documents are typically accessed. However, the Court still considers physical locations of electronically stored documents in its analysis of this factor. *In re Google LLC*, 2021 WL 5292267, at *2 (Fed. Cir. Nov. 15, 2021). When considering both parties generally, “in patent infringement cases, the bulk of the relevant evidence usually comes from the accused infringer. Consequently, the place where the defendant’s documents are kept weighs in favor of transfer to that location.” *In re Apple Inc.*, 979 F.3d at 1340 (citing *In re Genentech*, 566 F.3d at 1345).

ii. *Qualcomm and Apple’s Arguments*

The Defendants argue that this factor strongly favors transfer. To support the argument, the Defendants assert that NDCA, and California generally, is the primary location where the research, design, development, and testing of the accused features occurred. The Defendants argue that documents related to [REDACTED] [REDACTED]. ECF No. 45 at 13. The Defendants also assert that [REDACTED] [REDACTED]. *Id.* Meanwhile, the Defendants represent [REDACTED] [REDACTED]. ECF No. 101 at 39. The Defendants also argue that

the housing of Red Rock's documents in Houston is due to their choice of counsel and should not be considered in this analysis. *Id.* at 41.

iii. Red Rock's Arguments

Red Rock points out that Apple's financial records are [REDACTED]. ECF No. 73 at 13–14. Red Rock also represents there are several Qualcomm [REDACTED]. *Id.* at 22. Red Rock further asserts both Apple and Qualcomm are likely to have relevant technical documents stored in Texas due to the technical witnesses discussed above. *Id.* at 13–15. Red Rock also asserts technical documents held by Samsung Austin Semiconductor (SAS) would be relevant to proving infringement since [REDACTED]. *Id.* at 16. SAS would also have testing data that could help show the difference between pre-calibration and post-calibration metrics relevant to damages. ECF No. 109 at 20. Regarding Red Rock's own documents, Red Rock represents to have 47,985 pages of documents from a prior lawsuit stored on a server in Houston and maintained by Heim, Payne and Chorush. ECF No. 73 at 13.

iv. Analysis

The fact that shared documents are accessible from NDCA is irrelevant in this analysis, unless those same electronically shared documents are not accessible in WDTX or are stored in NDCA. The only documentation which has been explicitly stated as being stored in California is [REDACTED]. However, even the [REDACTED]. Qualcomm and Apple have also not specified what information is [REDACTED] in NDCA compared to servers in other locations. There is also no showing by the Defendants that

documents from any of Defendants' servers would not be accessible in WDTX. While CDCA is closer to NDCA than to WDTX, the impact of this consideration for this factor is significantly lessened by the fact [REDACTED].

The technical and testing documents held by SAS are likely to be of some limited importance. This is especially true if pre-calibration testing data by SAS would be unique to SAS, as represented by Red Rock. However, the relevance of documents held by SAS are likely to be small compared to the relevance of documents held by Red Rock, Apple, or Qualcomm. SAS manufactures and performs testing on wafers, but these wafers are not an end-product or themselves an accused product.

Finally, Red Rock's own documents from prior litigation, and held by counsel, do not weigh heavily on this factor. Although stored on a Houston server, there is no indication the documents from the prior litigation are unable to be accessed outside of Houston or the state of Texas. Further, it appears to have merely been Red Rock's counsel's choice to store the documents in Houston. Still, following precedent, the location of those electronically stored documents should be considered in this analysis.

Neither party has presented a compelling argument for an increased ease of access to sources of proof being present in either venue. If anything, the greater access to SAS technical and testing documents slightly disfavors transfer. The other arguments present little reason why this factor either favors or disfavors transfer. Therefore, this factor leans slightly against transfer.

3. Availability of Compulsory Process to Secure Attendance of Witnesses.

i. Legal Overview

Under the Federal Rules, a court may subpoena a witness to attend trial only (a) “within 100 miles of where the person resides, is employed, or regularly transacts business in person”; or (b) “within the state where the person resides, is employed, or regularly transacts business in person, if the person . . . is commanded to attend a trial and would not incur substantial expense.” Fed. R. Civ. P. 45(c)(1)(A), (B)(ii). This factor focuses on “non-party witnesses whose attendance may need to be secured by a court order.” *WirelessWerx, LLC v. Google, LLC*, No. 6:22-CV-1056-RP, 2023 WL 11921792, at *3 (W.D. Tex. Apr. 14, 2023) (collecting cases). “When there is no indication that a non-party witness is willing, the witness is presumed to be unwilling and considered under the compulsory process factor.” *Id.* citing *In re HP Inc.*, No. 2018-149, 2018 WL 4692486, at *3 n.1 (Fed. Cir. Sept. 25, 2018). However, the Fifth Circuit has clarified that “the availability of compulsory process ‘receives less weight when it has not been alleged or shown that any witness would be unwilling to testify.’” *In re Planned Parenthood Fed’n of Am. Inc.*, 52 F.4th 625, 630–31 (5th Cir. 2022) (quoting *Hefferan v. Ethicon Endo-Surgery Inc.*, 828 F.3d 488, 499 (6th Cir. 2016)). To note, this factor “weigh[s] heavily in favor of transfer when more third-party witnesses reside within the transferee venue than reside in the transferor venue.” *In re Apple*, 581 F. App’x 886, 889 (Fed. Cir. 2014) (citing *In re Genentech*, 566 F.3d at 1345).

ii. Qualcomm and Apple’s Arguments

The Defendants argue that this factor favors transfer. To support that argument, the Defendants point to multiple potential prior art inventors that Defendants picked out and that conveniently live within the subpoena power of NDCA. ECF No. 45 at 14. As a note, this Court does not find that the proposed prior art inventors provide much weight in this analysis. *See*

Fintiv, Inc. v. Apple Inc., 2019 WL 4743678, at *5 (W.D. Tex. Sept. 13, 2019). The Defendants also point to a co-author of a paper referenced by Red Rock that discusses I-Q gain imbalance calibration. ECF No. 45 at 9–10.

The Defendants assert that the potential SAS witnesses in Austin are irrelevant. ECF No. 101 at 35. The Defendants assert that the wafers produced by SAS are not claimed by the Asserted Patent and any information that could be provided by SAS is, at best, tangential to the core disputes in this lawsuit. *Id.* at 37.

iii. Red Rock's Arguments

Red Rock counters that this factor weighs against transfer. Red Rock points out that the prior art inventors, or paper authors referenced by the Defendants, are unlikely to actually be called to trial. ECF No. 73 at 17. Red Rock also points out that the wafers manufactured by SAS [REDACTED]. *Id.* Red Rock represents that SAS employees may also be the only individuals with access to some pre-calibration testing data. ECF No. 109 at 20. For these reasons amongst others, the Plaintiff asserts that SAS employees in Austin may have relevant information related to infringement and damages. *Id.* at 21.

iv. Analysis

The Court finds this factor slightly disfavors transfer. It is unlikely that any of the prior art inventors or paper authors who were hand-picked by the Defendants will testify at trial. Despite what the Defendants have represented, it is abundantly clear in this Court's experience that the authors of alleged prior art are unlikely to be utilized over an expert witness when arguing invalidity come time for trial. However, it is likely at least one witness from SAS will be called to testify regarding pre-calibration testing data. As the relationship between SAS and

Qualcomm is further developed in discovery, it may also be that SAS witnesses can be called to discuss additional technical features of the Accused Products. Therefore, this factor disfavors transfer.

4. All Other Practical Problems That Make Trial of a Case Easy, Expeditious, and Inexpensive.

i. Legal Overview

“When considering the private interest factors, courts must also consider all other practical problems that make trial of a case easy, expeditious and inexpensive.” *Wireless Werx, LLC v. Google, LLC*, No. 6:22-CV-1056-RP, 2023 WL 11921792, at *4 (W.D. Tex. Apr. 14, 2023) (citing *Volkswagen II*, 545 F.3d at 315.) “Particularly, the existence of duplicative suits involving the same or similar issues may create practical difficulties that will weigh heavily in favor or against transfer.” *PersonalWeb Techs., LLC v. NEC Corp. of Am., Inc.*, No. 6:11-cv-655, 2013 WL 9600333, at *5 (E.D. Tex. Mar. 21, 2013). It runs counter to judicial efficiency to have “two courts [construing] the same patent asserted by the same plaintiff.” *Acqis, LLC v. Sony Interactive Entm’t Inc.*, No. 6-22- cv-00386-ADA, ECF No. 63 at 15 (W.D. Tex. July 19, 2023).

ii. Analysis

There are no known co-pending or duplicative suits related to this lawsuit. Both parties contend this factor is neutral, and this Court agrees. With all concerned parties in agreement, this factor is neutral.

C. PUBLIC INTREST FACTORS

1. Administrative Difficulties Flowing from Court Congestion

i. Legal Overview

This factor concerns “whether there is an appreciable difference in docket congestion between the two forums.” *In re Adobe Inc.*, 823 F. App’x 929, 932 (Fed. Cir. 2020). It considers “[t]he speed with which a case can come to trial and be resolved.” *In re Genentech*, 566 F.3d at 1347; *see Smart Mobile Techs. LLC v. Apple Inc.*, 2023 WL 5540152, at *9 (W.D. Tex. Aug. 28, 2023). However, “this factor should not weigh against transfer when the patentee ‘is not engaged in product competition in the marketplace and is not threatened in the market in a way that, in other patent cases, might add urgency to case resolution.’” *In re Meta Platforms, Inc.*, No. 2023-143, 2023 WL 7118786, at *2 (Fed. Cir. Oct. 30, 2023) (quoting *In re Google LLC*, 58 F.4th 1379, 1383 (Fed. Cir. 2023)).

ii. Qualcomm and Apple’s Arguments

The Defendants argue that this factor should be neutral. The Defendants assert the time-to-trial data is similar in both WDTX and NDCA. ECF No. 101 at 42–43. The Defendants also point out the significant delay caused by extended transfer discovery and by Red Rock’s delay in filing their initial complaint. *Id.* at 43. The Defendants also assert that, even if there is a difference in time-to-trial of six or seven months, that time difference is not significant. *Id.*

The Defendants further assert the “opportunity costs” of being in NDCA compared to WDTX, as cited by Red Rock, are unreliable and not relevant since Red Rock has not been actively investing in developing a product. *Id.* The Defendants also take issue with Red Rock’s estimations for other losses and damages. *Id.* at 44.

iii. Red Rock’s Arguments

Red Rock argues that this factor should weigh against transfer, as WDTX and the Waco division is less congested than NDCA. ECF No. 73 at 23. Red Rock represents the average time

to trial in Waco for patent trials, since 2018, is around seven months faster than in NDCA. *Id.* Red Rock also makes additional assertions regarding the increased cost of litigation in NDCA compared to in Texas and the loss of opportunity costs caused by potential delay due to congestion, if this lawsuit is transferred to NDCA. *Id.* at 23–24.

iv. Analysis

In attempting to apply governing precedent, the Court finds that this factor is neutral. The Federal Circuit has instructed that court congestion cannot weigh against transfer where an entity like Red Rock “is not engaged in product competition in the marketplace and is not threatened in the market in a way that, in other patent cases, might add urgency to case resolution.” *See In re Meta*, 2023 WL 7118786, at *2. However, this Federal Circuit precedent appears to contradict Fifth Circuit rulings. For example, in *In re Planned Parenthood Federation of America, Inc.*, 52 F.4th 625, 631–32 (5th Cir. 2022), the Fifth Circuit held that it was not an abuse of discretion for the district court to weigh court congestion against transfer based on just two rationales: 1) that its docket was less congested than the transferee venue’s; and 2) that the case “appear[ed] to be timely proceeding to trial” before the transferor venue. *See also U.S. v. Planned Parenthood Fed. of Am., Inc.*, No. 2:21-CV-022-Z, 2022 WL 19006361, at *4–5 (N.D. Tex. Sept. 20, 2022). Further, the Fifth Circuit later defined this case progression factor as follows: “This factor normally weighs against transfer when the case appears to be timely proceeding to trial before the transferee [sic] district.” *In re TikTok, Inc.*, 85 F.4th 352, 363 (5th Cir. 2023) (cleaned up). This conflict is dispositive here—Red Rock only argues that the public interest in speedy resolution of disputes causes this factor to weigh against transfer. Red Rock does not allege that it competes with Apple in the marketplace. Red Rock’s arguments about the difference in time to

trial between NDCA and this Court would hold weight according to Fifth Circuit caselaw on this factor. *See In re TikTok*, 85 F.4th 352, 363–64 (5th Cir. 2023). Concerns with time to trial considerations originated over the court congestion factor being given “particular significance” or “significant weight.” *See In re Morgan Stanley*, 417 F. App’x at 950. In contrast, our precedent now seems to require categorically prejudicing specific groups of plaintiffs. This prejudice takes the form of preventing court congestion being assigned *any* weight against transfer in circumstances involving non-practicing entities or those which are not competitors in a patent suit. *See In re Meta*, 2023 WL 7118786, at *2; *Zentian Ltd. v. Apple Inc.*, No. W-22-CV-00122-ADA, 2023 WL 4167746, at *10. This Court ultimately aims to apply precedent in the only way that seems to follow this apparent contradiction. Accordingly, non-practicing entities in patent cases will be prejudiced relative to other plaintiffs. Court congestion will be awarded no weight in their cases. Therefore, this factor is neutral. Should a petition for mandamus be filed, Red Rock is encouraged to raise arguments to clear up any misapprehensions in Fifth Circuit and Federal Circuit precedent regarding the differential treatment of certain plaintiffs.

If this ruling is brought to appeal, and the Federal Circuit finds that non-practicing entities are not subject to this prejudice, but that in the alternative the district courts are best situated to evaluate their own docket efficiency, as the Fifth Circuit held in *In re Clarke*, this Court believes that this factor weighs against transfer. Red Rock’s estimated cost increases are speculative and backed by unreliable estimates. Although there has been significant delay in the transfer proceedings for this case (caused by extensive transfer discovery and briefing), the average time to trial in Waco for patent trials is still several months less than the average time of a patent trial in NDCA. There is no indication transfer of this case to NDCA would result in less

delay than WDTX, moving forward. Therefore, if the difference in court congestion can be awarded weight in this case, this factor weighs against transfer.

2. Local Interest

i. Legal Overview

Under this factor, the Court must evaluate whether there is a local interest in deciding local issues at home. *Volkswagen II*, 545 F.3d at 317. Local interests in patent cases “are not a fiction.” *In re Samsung Elecs. Co.*, 2 F.4th 1371, 1380 (Fed. Cir. 2021). “A local interest is demonstrated by a relevant factual connection between the events and the venue.” *Word to Info, Inc. v. Facebook, Inc.*, No. 3:14-CV-04387-K, 2015 WL 13870507, at *4 (N.D. Tex. Jul. 23, 2015). “[T]he sale of an accused product offered nationwide does not give rise to a substantial interest in any single venue.” *In re Hoffmann-La Roche Inc.*, 587 F.3d 1333, 1338 (Fed. Cir. 2009). “This factor most notably regards not merely the parties’ significant connections to each forum writ large, but rather the ‘significant connections between a particular venue and the events that gave rise to a suit.’” *In re Apple*, 979 F.3d at 1344 (emphasis in original) (quoting *In re Acer Am. Corp.*, 626 F.3d 1252, 1256 (Fed. Cir. 2010)). Courts should not heavily weigh a party’s general contacts with a forum that are untethered from the lawsuit, such as a general presence. *Id.* Moreover, “little or no weight should be accorded to a party’s ‘recent and ephemeral’ presence in the transferor forum, such as by establishing an office to claim a presence in the district for purposes of litigation.” *In re Juniper Networks, Inc.*, 14 F.4th at 1320 (quoting *In re Microsoft Corp.*, 630 F.3d 1361, 1365 (Fed. Cir. 2011) (per curiam)). To determine which district has the stronger local interest, the Court looks to where the events forming the basis for infringement occurred. *Id.* at 1319. “We focus on the *events*—not the *parties*. We do not consider

the parties' connections to the venue because the local interest analysis is a public interest factor. Accordingly, the local-interest inquiry is concerned with the interest of *non-party citizens* in adjudicating the case.” *In re Clarke*, No. 24-50079, 2024 WL 886953, at *5 (5th Cir. Mar. 1, 2024) (emphases in original).

ii. Qualcomm and Apple's Arguments

The Defendants' position is that this factor strongly favors transfer. In support of that position, the Defendants point out that Apple's engineering groups responsible for integration and testing of Qualcomm transceivers with Apple products are in NDCA. ECF No. 45 at 18. The Defendants also point to Apple's general presence within NDCA such as their headquarters. The Defendants further represent that Qualcomm's [REDACTED] [REDACTED]. *Id.*

iii. Red Rock's Arguments

Red Rock's view is that this factor is against transfer. Red Rock argues that WDTX has a strong local interest due to significant current development and relevant witnesses found in WDTX. ECF No. 73 at 24. Red Rock further represents there is significant development of hardware features in WDTX that are a part of the Accused Products. *Id.*

iv. Analysis

This Court finds that this factor leans slightly in favor of transfer. This is not a case where there exists no local interest in the outcome of this case. *In re Samsung Elecs. Co.*, 2 F.4th at 1380. The general presence in either venue does not move the needle in either direction. Past and present research related to the Accused Products is performed in both WDTX and NDCA. Significant current development and the development of applicable hardware features in Austin

provide a local interest in WDTX. However, NDCA also has its own local interests due to the presence of Apple's engineering groups responsible for integrating Qualcomm's transceivers into Apple products. Qualcomm also has some local interest in California generally, however it is unclear from the Defendant's briefing how much of the research, design, and development of the Accused Products actually occurred in NDCA compared to elsewhere in California.

When the two venues are compared to one another, it is not clear that either WDTX or NDCA have a significant local interest. Therefore, this factor is neutral.

3. Familiarity of the Forum with the Law That will Govern the Case And Avoidance of Unnecessary Problems of Conflict of Laws or in the Application of Foreign Law.

i. Analysis

There is no reason to believe that the federal courts in NDCA are any more or less familiar with federal law than the federal courts in WDTX. Nor are there issues involving conflicts of foreign laws. The parties both contend that these two factors are neutral, and this Court agrees. With all concerned parties in agreement, these two factors are neutral.

D. RED ROCK'S EXPERT DECLARATIONS

The Court acknowledges Defendants' concerns regarding Red Rock's expert declarations. However, as it is the Court itself reviewing the declarations at this time, and not a jury, the concerns regarding legal arguments by non-lawyers and any potential use of unreliable methods of gathering data are not as pressing. The Court does not provide a current opinion on whether the methodology or discussion within Red Rock's expert declarations are sufficient to survive a later challenge.

E. RESONANT SYSTEMS APPLICABILITY

The Court further acknowledges Red Rock’s comparison of the Defendants’ actions to those leading to the Federal Circuit’s affirmance of the order denying transfer in *Resonant Systems, Inc. v. Apple, Inc.*, No. 7:23-cv-00077-ADA, Dkt. 83 (W.D. Tex. April 18, 2024); *In re Apple Inc.*, No. 2024-129, 2024 U.S. App. LEXIS 21081 (Fed. Cir. August 21, 2024) (denying mandamus). Red Rock asserts this case should be compared to *Resonant*, since the Defendants’ today have also failed to adequately investigate and identify relevant witnesses in WDTX. ECF No. 166 at 2. Red rock further asserts the Defendants placed a “thumb [on] one side of the scale[s]” by providing “selectively ignorant declarations.” *Id.*

The Defendants represent that they have “provided extensive discovery into their WDTX activities.” ECF No. 168 at 2. The Defendants represent that they have interviewed multiple Texas site managers and managers overseeing Austin teams, surveyed Texas employees, and provided lists of Texas-based employees. *Id.* However, motions to transfer are reviewed on an individualized, case-by-case consideration of convenience and fairness.” *Stewart Org., Inc. v. Ricoh Corp.*, 487 U.S. 22, 29 (1988) (quoting *Van Dusen v. Barrack*, 376 U.S. 612, 622 (1964)). The Court does not need to make a comparison to *Resonant* to determine whether or not to grant Defendants’ motion to transfer venue, as the facts here are sufficiently different and the decision regarding transfer stands on its own merit.

V) CONCLUSION

The factors considered in a transfer for convenience are considered in their totality. After the factors are considered, the standard requires a determination of if the transferee venue would be “clearly more convenient.” *Volkswagen II*, 545 F.3d at 314. This deference arises due to the plaintiff’s right to choose an appropriate venue to bring their case. *See In re Chamber of Com. of*

United States of Am., 105 F.4th at 302 (5th Cir. 2024). The movant has not established that this case would be clearly more convenient in the Northern District of California. The chart below summarizes the Court's analysis; however, it is in weighing the totality of these factors and circumstances of this case that this Court determines that this motion must be denied.

ACCORDINGLY, IT IS ORDERED that the Defendants' Motion to Transfer is **DENIED**.

FACTOR	THE COURT'S FINDING
Relative ease of access to sources of proof.	Slightly against transfer.
Cost of attendance for willing witnesses.	Neutral.
Availability of compulsory process to secure the attendance of witnesses.	Against transfer.
All other practical problems that make trial of a case easy, expeditious, and inexpensive.	Neutral.
Administrative difficulties flowing from court congestion.	Neutral, see above.
Local interest.	Neutral.
Familiarity of the forum with law that will govern case.	Neutral.
Problems associated with conflict of law.	Neutral.

So **ORDERED** this 12th of February, 2025.


 ALAN D. BRIGHT
 UNITED STATES DISTRICT JUDGE

**U.S. District Court [LIVE]
Western District of Texas (Waco)
CIVIL DOCKET FOR CASE #: 6:21-cv-00346-ADA**

Red Rock Analytics, LLC v. Apple Inc. et al
Assigned to: Judge Alan D Albright
Cause: 35:271 Patent Infringement

Date Filed: 04/08/2021
Jury Demand: Both
Nature of Suit: 830 Patent
Jurisdiction: Federal Question

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*LEAD ATTORNEY**ATTORNEY TO BE NOTICED***Claire Abernathy Henry**

(See above for address)
ATTORNEY TO BE NOTICED

Elizabeth L. DeRieux
 (See above for address)
ATTORNEY TO BE NOTICED

Michael F. Heim
 (See above for address)
ATTORNEY TO BE NOTICED

S. Calvin Capshaw , III
 (See above for address)
ATTORNEY TO BE NOTICED

T. John Ward , Jr.
 (See above for address)
ATTORNEY TO BE NOTICED

Leslie V. Payne
 (See above for address)
ATTORNEY TO BE NOTICED

Date Filed	#	Docket Text
04/08/2021	1	COMPLAINT <i>for Patent Infringement</i> (Filing fee \$ 402 receipt number 0542-14676426). No Summons requested at this time, filed by Red Rock Analytics, LLC. (Attachments: # 1 Exhibit A, # 2 Exhibit B, # 3 Civil Cover Sheet)(Payne, Leslie) (Entered: 04/08/2021)
04/08/2021		All parties shall comply with the Standing Orders of Judge Alan D. Albright located at https://www.txwd.uscourts.gov/judges-information/standing-orders/ . (lad) (Entered: 04/08/2021)
04/08/2021	2	MOTION to Appear Pro Hac Vice by Alden G. Harris (Filing fee \$ 100 receipt number 0542-14676830) by on behalf of Red Rock Analytics, LLC. (Harris, Alden) (Entered: 04/08/2021)
04/08/2021	3	MOTION to Appear Pro Hac Vice by Leslie V. Payne <i>for Kyle Ruvolo</i> (Filing fee \$ 100 receipt number 0542-14676923) by on behalf of Red Rock Analytics, LLC. (Payne, Leslie) (Entered: 04/08/2021)
04/08/2021	4	Notice of Filing of Patent/Trademark Form (AO 120). AO 120 forwarded to the Director of the U.S. Patent and Trademark Office. (Payne, Leslie) (Entered: 04/08/2021)
04/08/2021	5	RULE 7 DISCLOSURE STATEMENT filed by Red Rock Analytics, LLC. (Payne, Leslie) (Entered: 04/08/2021)
04/08/2021	6	SUPPLEMENT to 3 MOTION to Appear Pro Hac Vice by Leslie V. Payne <i>for Kyle Ruvolo</i> (Filing fee \$ 100 receipt number 0542-14676923) by Red Rock Analytics, LLC. (Payne, Leslie) (Entered: 04/08/2021)
04/08/2021	7	SUPPLEMENT to 2 MOTION to Appear Pro Hac Vice by Alden G. Harris (Filing fee \$ 100 receipt number 0542-14676830) by Red Rock Analytics, LLC. (Harris, Alden) (Entered: 04/08/2021)
04/08/2021		Case assigned to Judge Alan D Albright. CM WILL NOW REFLECT THE JUDGE INITIALS AS PART OF THE CASE NUMBER. PLEASE APPEND THESE JUDGE INITIALS TO THE CASE NUMBER ON EACH DOCUMENT THAT YOU FILE IN THIS CASE. (lad) (Entered: 04/08/2021)
04/09/2021	8	REQUEST FOR ISSUANCE OF SUMMONS by Red Rock Analytics, LLC. <i>for Apple Inc. and Qualcomm, Inc.</i> (Payne, Leslie) (Entered: 04/09/2021)
04/09/2021	9	Summons Issued as to Apple Inc.. (lad) (Entered: 04/09/2021)
04/09/2021	10	Summons Issued as to Qualcomm, Inc.. (lad) (Entered: 04/09/2021)

04/13/2021	11	SUMMONS Returned Executed by Red Rock Analytics, LLC. Qualcomm, Inc. served on 4/12/2021, answer due 5/3/2021. (Payne, Leslie) (Entered: 04/13/2021)
04/14/2021	12	SUMMONS Returned Executed by Red Rock Analytics, LLC. Apple Inc. served on 4/12/2021, answer due 5/3/2021. (Payne, Leslie) (Entered: 04/14/2021)
04/19/2021		Text Order GRANTING 2 Motion to Appear Pro Hac Vice for Attorney Alden G. Harris for Red Rock Analytics, LLC. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-I (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (mm6) (Entered: 04/19/2021)
04/19/2021		Text Order GRANTING 3 Motion to Appear Pro Hac Vice for Attorney Kyle Ruvolo for Red Rock Analytics, LLC. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-I (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (mm6) (Entered: 04/19/2021)
04/19/2021	13	NOTICE of Attorney Appearance by J. Stephen Ravel on behalf of Apple Inc.. Attorney J. Stephen Ravel added to party Apple Inc.(pty:dft) (Ravel, J.) (Entered: 04/19/2021)
04/19/2021	14	Unopposed MOTION for Extension of Time to File Answer re 1 Complaint, by Apple Inc.. (Attachments: # 1 Proposed Order)(Ravel, J.) (Entered: 04/19/2021)
04/20/2021		Text Order GRANTING 14 Motion for Extension of Time to Answer entered by Judge Alan D Albright. It is therefore ORDERED that Defendant Apple Inc.'s Unopposed Motion is GRANTED, and Defendant's deadline to file a response to Plaintiff's Complaint is hereby extended through and including June 17, 2021. (This is a text-only entry generated by the court. There is no document associated with this entry.) (re) (Entered: 04/20/2021)
04/20/2021		Reset Deadlines: Apple Inc. answer due 6/17/2021. (klw) (Entered: 04/20/2021)
04/22/2021	15	Unopposed MOTION for Extension of Time to File Answer re 1 Complaint, by Qualcomm, Inc.. (Attachments: # 1 Proposed Order)(Kubehl, Douglas) (Entered: 04/22/2021)
05/03/2021		Text Order GRANTING 15 Motion for Extension of Time to Answer entered by Judge Alan D Albright. IT IS THEREFORE ORDERED that Qualcomm Incorporated's Motion for Extension of Time is GRANTED; and IT IS FURTHER ORDERED that Qualcomm Incorporated shall have up to and including June 17, 2021 to answer or otherwise respond to the Complaint. (This is a text-only entry generated by the court. There is no document associated with this entry.) (re) (Entered: 05/03/2021)
05/03/2021		Reset Answer Deadlines: Qualcomm, Inc. answer due 6/17/2021. (bw) (Entered: 05/03/2021)
06/16/2021	16	Standing Order regarding Scheduling Order. Signed by Judge Alan D Albright. (Entered: 06/17/2021)
06/17/2021	17	MOTION to Dismiss <i>Apple Inc.'s 12(b)(6) Motion to Dismiss</i> by Apple Inc.. (Ravel, J.) (Entered: 06/17/2021)
06/17/2021	18	RULE 7 DISCLOSURE STATEMENT filed by Apple Inc.. (Ravel, J.) (Entered: 06/17/2021)
06/17/2021	19	<i>Defendant Qualcomm's</i> ANSWER to 1 Complaint, with Jury Demand , COUNTERCLAIM against Red Rock Analytics, LLC by Qualcomm, Inc..(Kubehl, Douglas) (Entered: 06/17/2021)

06/17/2021	20	RULE 7 DISCLOSURE STATEMENT filed by Qualcomm, Inc.. (Kubehl, Douglas) (Entered: 06/17/2021)
06/23/2021	21	MOTION to Appear Pro Hac Vice by J. Stephen Ravel <i>on behalf of Mark D. Selwyn</i> (Filing fee \$ 100 receipt number 0542-14943914) by on behalf of Apple Inc.. (Attachments: # 1 Proposed Order)(Ravel, J.) (Entered: 06/23/2021)
06/23/2021	22	MOTION to Appear Pro Hac Vice by J. Stephen Ravel <i>on behalf of Joseph F. Haag</i> (Filing fee \$ 100 receipt number 0542-14943953) by on behalf of Apple Inc.. (Attachments: # 1 Proposed Order)(Ravel, J.) (Entered: 06/23/2021)
06/23/2021	23	MOTION to Appear Pro Hac Vice by J. Stephen Ravel <i>on behalf of S. Dennis Wang</i> (Filing fee \$ 100 receipt number 0542-14943970) by on behalf of Apple Inc.. (Attachments: # 1 Proposed Order)(Ravel, J.) (Entered: 06/23/2021)
06/23/2021	24	MOTION to Appear Pro Hac Vice by J. Stephen Ravel <i>on behalf of Henry Nikogosyan</i> (Filing fee \$ 100 receipt number 0542-14943988) by on behalf of Apple Inc.. (Attachments: # 1 Proposed Order) (Ravel, J.) (Entered: 06/23/2021)
06/23/2021	25	MOTION to Appear Pro Hac Vice by J. Stephen Ravel <i>on behalf of Joseph J. Mueller</i> (Filing fee \$ 100 receipt number 0542-14943997) by on behalf of Apple Inc.. (Attachments: # 1 Proposed Order) (Ravel, J.) (Entered: 06/23/2021)
06/23/2021	26	MOTION to Appear Pro Hac Vice by J. Stephen Ravel <i>on behalf of Monica Grewal</i> (Filing fee \$ 100 receipt number 0542-14944010) by on behalf of Apple Inc.. (Attachments: # 1 Proposed Order)(Ravel, J.) (Entered: 06/23/2021)
06/23/2021	27	MOTION to Appear Pro Hac Vice by J. Stephen Ravel <i>on behalf of Annaleigh Curtis</i> (Filing fee \$ 100 receipt number 0542-14944021) by on behalf of Apple Inc.. (Attachments: # 1 Proposed Order) (Ravel, J.) (Entered: 06/23/2021)
06/23/2021	28	MOTION to Appear Pro Hac Vice by J. Stephen Ravel <i>on behalf of Madeleine Laupheimer</i> (Filing fee \$ 100 receipt number 0542-14944035) by on behalf of Apple Inc.. (Attachments: # 1 Proposed Order)(Ravel, J.) (Entered: 06/23/2021)
06/23/2021	29	NOTICE of Attorney Appearance by J. Stephen Ravel on behalf of Apple Inc. (Ravel, J.) (Entered: 06/23/2021)
06/24/2021		Text Order GRANTING 21 Motion to Appear Pro Hac Vice. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-I (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (re) (Entered: 06/24/2021)
06/24/2021		Text Order GRANTING 22 Motion to Appear Pro Hac Vice. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-I (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D Albright.(This is a text-only entry generated by the court. There is no document associated with this entry.) (re) (Entered: 06/24/2021)
06/24/2021		Text Order GRANTING 23 Motion to Appear Pro Hac Vice. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-I (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the

		attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D Albright.(This is a text-only entry generated by the court. There is no document associated with this entry.) (re) (Entered: 06/24/2021)
06/24/2021		Text Order GRANTING 24 Motion to Appear Pro Hac Vice. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-I (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D Albright.(This is a text-only entry generated by the court. There is no document associated with this entry.) (re) (Entered: 06/24/2021)
06/24/2021		Text Order GRANTING 25 Motion to Appear Pro Hac Vice. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-I (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D Albright.(This is a text-only entry generated by the court. There is no document associated with this entry.) (re) (Entered: 06/24/2021)
06/24/2021		Text Order GRANTING 26 Motion to Appear Pro Hac Vice. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-I (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (re) (Entered: 06/24/2021)
06/24/2021		Text Order GRANTING 27 Motion to Appear Pro Hac Vice. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-I (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (re) (Entered: 06/24/2021)
06/24/2021		Text Order GRANTING 28 Motion to Appear Pro Hac Vice. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-I (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (re) (Entered: 06/24/2021)
06/24/2021	30	NOTICE of Joint Case Readiness Status Report by Red Rock Analytics, LLC (Harris, Alden) (Entered: 06/24/2021)
06/30/2021	31	AMENDED COMPLAINT <i>Red Rock Analytics, LLC's First Amended Complaint for Patent Infringement</i> against Apple Inc., Qualcomm, Inc. amending, filed by Red Rock Analytics, LLC. (Attachments: # 1 Exhibit A, # 2 Exhibit B, # 3 Exhibit C)(Payne, Leslie) (Entered: 06/30/2021)
07/01/2021	32	RESPONSE to Motion, filed by Red Rock Analytics, LLC, re 17 MOTION to Dismiss <i>Apple Inc.'s 12(b)(6) Motion to Dismiss</i> filed by Defendant Apple Inc. (Attachments: # 1 Proposed Order)(Harris,

		Alden) (Entered: 07/01/2021)
07/02/2021	33	NOTICE of Compliance by Red Rock Analytics, LLC (Henry, Claire) (Entered: 07/02/2021)
07/08/2021	34	Red Rock's ANSWER to 19 Answer to Complaint, Counterclaim by Red Rock Analytics, LLC.(Harris, Alden) (Entered: 07/08/2021)
07/14/2021	35	DEFENDANT QUALCOMM'S ANSWER to 31 Amended Complaint, with Jury Demand , COUNTERCLAIM against Red Rock Analytics, LLC by Qualcomm, Inc..(Kubehl, Douglas) (Entered: 07/14/2021)
07/14/2021	36	MOTION to Dismiss <i>12(b)(6) Motion to Dismiss First Amended Complaint</i> by Apple Inc.. (Ravel, J.) (Entered: 07/14/2021)
07/15/2021	37	Red Rock's ANSWER to 35 Answer to Amended Complaint, Counterclaim by Red Rock Analytics, LLC.(Harris, Alden) (Entered: 07/15/2021)
07/22/2021	38	Joint MOTION for Entry of Agreed Scheduling Order by Red Rock Analytics, LLC. (Attachments: # 1 Agreed Scheduling Order)(Harris, Alden) (Entered: 07/22/2021)
07/27/2021	39	ORDER GRANTING SCHEDULING ORDER 38 Motion Signed by Judge Alan D Albright. (ab4) (Entered: 07/28/2021)
07/27/2021		Set Hearings pursuant to 39 : Markman Hearing set for 1/13/2022 09:00 AM before Judge Alan D Albright (lad) (Entered: 12/03/2021)
07/28/2021	40	Response in Opposition to Motion, filed by Red Rock Analytics, LLC, re 36 MOTION to Dismiss <i>12(b)(6) Motion to Dismiss First Amended Complaint</i> filed by Defendant Apple Inc. (Attachments: # 1 Declaration of Alden Harris, # 2 Exhibit 1, # 3 Proposed Order)(Harris, Alden) (Entered: 07/28/2021)
07/30/2021	41	NOTICE of Attorney Appearance by Aashish G. Kapadia on behalf of Qualcomm, Inc.. Attorney Aashish G. Kapadia added to party Qualcomm, Inc.(pty:dft) (Kapadia, Aashish) (Entered: 07/30/2021)
07/30/2021	42	NOTICE of Attorney Appearance by Nick Schuneman on behalf of Qualcomm, Inc.. Attorney Nick Schuneman added to party Qualcomm, Inc.(pty:dft) (Schuneman, Nick) (Entered: 07/30/2021)
08/03/2021	43	MOTION to Appear Pro Hac Vice by Douglas M. Kubehl <i>Motion for Admission Pro Hac-Sarah Guske</i> (Filing fee \$ 100 receipt number 0542-15079361) by on behalf of Qualcomm, Inc.. (Attachments: # 1 Proposed Order Proposed Order-Motion Pro Hac-Sarah Guske)(Kubehl, Douglas) (Entered: 08/03/2021)
08/03/2021		Text Order GRANTING 43 Motion to Appear Pro Hac Vice for Attorney Sarah Guske for Qualcomm, Inc. Before the Court is the Motion for Admission Pro Hac Vice. The Court, having reviewed the Motion, finds it should be GRANTED and therefore orders as follows: IT IS ORDERED the Motion for Admission Pro Hac Vice is GRANTED. IT IS FURTHER ORDERED that Applicant, if he/she has not already done so, shall immediately tender the amount of \$100.00, made payable to: Clerk, U.S. District Court, in compliance with Local Rule AT-I (f)(2). Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (jc5) (Entered: 08/04/2021)
08/04/2021	44	REPLY to Response to Motion, filed by Apple Inc., re 36 MOTION to Dismiss <i>12(b)(6) Motion to Dismiss First Amended Complaint</i> filed by Defendant Apple Inc. (Attachments: # 1 Affidavit Declaration of J. Stephen Ravel, # 2 Exhibit 1)(Ravel, J.) (Entered: 08/04/2021)
08/24/2021	45	MOTION to Transfer Case <i>Defendants Qualcomm Inc. and Apple Inc.'s Opposed Motion to Transfer Venue to the Northern District of California</i> by Qualcomm, Inc.. (Attachments: # 1 Affidavit Declaration of Sarah Guske, # 2 Exhibit 1 to Guske Declaration, # 3 Exhibit 2 to Guske Declaration, # 4 Exhibit 3 to Guske Declaration, # 5 Exhibit 4 to Guske Declaration, # 6 Exhibit 5 to Guske Declaration, # 7 Exhibit 6 to Guske Declaration, # 8 Exhibit 7 to Guske Declaration, # 9 Exhibit 8 to Guske Declaration, # 10 Exhibit 9 to Guske Declaration, # 11 Exhibit 10 to Guske Declaration, # 12 Exhibit 11 to Guske Declaration, # 13 Exhibit 12 to Guske Declaration, # 14 Exhibit 13 to Guske Declaration, # 15 Affidavit Declaration of Anthony Simon, # 16 Affidavit Declaration of Rajiv Vijayan, # 17 Affidavit Declaration of Mark Rollins, # 18 Proposed Order)(Kubehl, Douglas) (Entered: 08/24/2021)

09/02/2021	46	NOTICE of Intent to Take Discovery by Red Rock Analytics, LLC re 45 MOTION to Transfer Case Defendants Qualcomm Inc. and Apple Inc.'s Opposed Motion to Transfer Venue to the Northern District of California (Harris, Alden) (Entered: 09/02/2021)
09/16/2021	47	NOTICE Regarding Compliance re service of Preliminary Invalidity Contentions of Qualcomm Inc. and Apple Inc. by Qualcomm, Inc. (Schuneman, Nick) (Entered: 09/16/2021)
10/08/2021	48	Standing Order Regarding Order Governing Proceedings Patent Cases. Signed by Judge Alan D Albright. (Entered: 10/13/2021)
10/26/2021	49	Opening Claim Construction Brief by Apple Inc., Qualcomm, Inc.. (Attachments: # 1 Exhibit 1, # 2 Exhibit 2, # 3 Exhibit 3, # 4 Exhibit 4, # 5 Exhibit 5, # 6 Exhibit 6, # 7 Exhibit 7, # 8 Exhibit 8, # 9 Exhibit 9, # 10 Exhibit 10, # 11 Exhibit 11, # 12 Exhibit 12, # 13 Exhibit 13, # 14 Exhibit 14)(Kubehl, Douglas) (Entered: 10/26/2021)
11/16/2021	50	Opening Claim Construction Brief regarding 49 Claim Construction Brief, by Red Rock Analytics, LLC. (Attachments: # 1 Declaration of A. Harris, # 2 Exhibit A, # 3 Exhibit B, # 4 Exhibit C, # 5 Exhibit D, # 6 Exhibit E, # 7 Exhibit F, # 8 Exhibit G, # 9 Exhibit H)(Harris, Alden) (Entered: 11/16/2021)
11/17/2021	51	ORDER, (Discovery Hearing set for 11/18/2021 09:00 AM before Judge Alan D Albright). Signed by Judge Alan D Albright. (bot3) (Entered: 11/17/2021)
11/18/2021	52	Minute Entry for proceedings held before Judge Alan D Albright: Discovery Hearing held on 11/18/2021. Case called for Discovery Hearing by zoom. The Court heard argument from both parties regarding the discovery issues. The Court determined that he will take the matter under advisement and asks the Plaintiff to provide the Court with a draft order with the specifics of what they are requesting. The Court would like this today or tomorrow at the latest. The Court will use that as a springboard to determined how he will rule on the requests. (Minute entry documents are not available electronically.) (Court Reporter Kristie Davis.) (jc5) (Entered: 11/18/2021)
11/18/2021	53	ORDER, (Discovery Hearing set for 11/22/2021 01:30 PM before Judge Alan D Albright). Signed by Judge Alan D Albright. (bot1) (Entered: 11/18/2021)
11/18/2021	54	Transcript filed of Proceedings held on 11-18-21, Proceedings Transcribed: Discovery Hearing (Zoom). Court Reporter/Transcriber: Kristie Davis, Telephone number: 254-340-6114, Email: kristie_davis@txwd.uscourts.gov. (kd) (Entered: 11/18/2021)
11/22/2021	55	Minute Entry for proceedings held before Judge Alan D Albright: Discovery Hearing held on 11/22/2021. Case called for a Discovery Hearing by Zoom. After hearing argument regarding discovery the Court has ordered that defendant Qualcomm shall provide discovery items to the plaintiff by the end of next week. The Court has also suggested to plaintiff that they provide to the defendant before the 30(b)6 witness depositions, a list of questions that they will be asking in order to allow the witnesses to be prepared for the deposition and that the plaintiff can they ask follow-up questions to the answer that they receive. (Minute entry documents are not available electronically.). (Court Reporter Kristie Davis.) (jc5) (Entered: 11/22/2021)
11/26/2021	56	11-22-21 Discovery hearing Sealed Transcript filed (This transcript is not available electronically) (kd) (Entered: 11/26/2021)
12/02/2021	57	Reply Claim Construction Brief by Apple Inc., Qualcomm, Inc.. (Attachments: # 1 Exhibit 15, # 2 Exhibit 16, # 3 Exhibit 17, # 4 Exhibit 18)(Kubehl, Douglas) (Entered: 12/02/2021)
12/02/2021	58	Joint MOTION to Amend/Correct 39 Order on Motion for Miscellaneous Relief ***JOINT MOTION TO AMEND SCHEDULING ORDER*** by Qualcomm, Inc.. (Attachments: # 1 Proposed Order) (Guske, Sarah) (Entered: 12/02/2021)
12/02/2021	59	Joint MOTION ***STATUS REPORT AND JOINT MOTION REGARDING AMENDING DISCOVERY AND BRIEFING SCHEDULE FOR DEFENDANTS MOTION TO TRANSFER*** by Qualcomm, Inc.. (Attachments: # 1 Proposed Order)(Guske, Sarah) (Entered: 12/02/2021)
12/03/2021	60	DEFICIENCY NOTICE: re: 59 Pursuant to existing Standing Orders, changes to the schedule that do not involve reset of hearings or trial dates may be agreed and NOTICED to the Court rather that filed as a motion. Instant Motion will be terminated. Please refile as a Notice. (lad) (Entered: 12/03/2021)

12/03/2021	61	NOTICE <i>Corrected Joint Notice ***Status Report and Joint Notice Regarding Amending Discovery and Briefing Schedule for Defendants Motion to Transfer***</i> by Qualcomm, Inc. (Guske, Sarah) (Entered: 12/03/2021)
12/08/2021	62	ORDER DENYING 36 Motion to Dismiss. Signed by Judge Alan D Albright. (jc5) (Entered: 12/08/2021)
12/08/2021	63	AMENDED SCHEDULING ORDER: Markman Hearing reset for 2/24/2022 09:00 AM before Judge Alan D Albright. Signed by Judge Alan D Albright. (jc5) (Entered: 12/08/2021)
12/16/2021	64	BRIEF <i>Sur-Reply Claim Construction Brief</i> by Red Rock Analytics, LLC. (Attachments: # 1 Declaration of Alden G. Harris, # 2 Exhibit I)(Harris, Alden) (Entered: 12/16/2021)
12/17/2021	65	Joint Claim Construction Brief or Statement by Red Rock Analytics, LLC. (Attachments: # 1 Exhibit A)(Harris, Alden) (Entered: 12/17/2021)
12/22/2021	66	ANSWER to 31 Amended Complaint, with Jury Demand <i>Answer and Affirmative Defenses to First Amended Complaint for Patent Infringement</i> by Apple Inc..(Ravel, J.) (Entered: 12/22/2021)
12/31/2021	67	NOTICE *** <i>JOINT NOTICE REGARDING AMENDING DEADLINE FOR TECHNICAL TUTORIALS</i> *** by Qualcomm, Inc. (Attachments: # 1 Exhibit 1, # 2 Exhibit 2)(Schuneman, Nick) Modified on 1/3/2022 (jc5). (Entered: 12/31/2021)
01/04/2022	68	ORDER, (Markman Hearing set for 1/27/2022 01:30 PM before Judge Alan D Albright). Signed by Judge Alan D Albright. (bot3) (Entered: 01/04/2022)
01/05/2022	69	NOTICE <i>Joint Notice Extending Briefing Schedule</i> by Red Rock Analytics, LLC re 45 MOTION to Transfer Case <i>Defendants Qualcomm Inc. and Apple Inc.'s Opposed Motion to Transfer Venue to the Northern District of California</i> (Harris, Alden) (Entered: 01/05/2022)
01/06/2022	70	ORDER, (Markman Hearing RESET for 2/28/2022 09:00 AM before Judge Alan D Albright). Signed by Judge Alan D Albright. (bot1) (Entered: 01/06/2022)
01/10/2022	71	ORDER APPOINTING TECHNICAL ADVISOR. Signed by Judge Alan D Albright. (lad) (Entered: 01/10/2022)
01/14/2022	72	Joint MOTION to Amend/Correct 63 Scheduling Order *** <i>JOINT MOTION TO AMEND FIRST AMENDED AGREED SCHEDULING ORDER</i> *** by Qualcomm, Inc.. (Attachments: # 1 Exhibit 1 - Second Amended Agreed Scheduling Order)(Schuneman, Nick) (Entered: 01/14/2022)
01/14/2022	73	Sealed Motion RED ROCKS RESPONSE IN OPPOSITION TO DEFENDANTS MOTION TO TRANSFER VENUE by Red Rock Analytics, LLC (Attachments: # 1 Declaration of Ronald Murias, # 2 Declaration of Roy Weinstein, # 3 Declaration of Jeffrey Fischer, # 4 Declaration of Alden Harris, # 5 Exhibit 1, # 6 Exhibit 2, # 7 Exhibit 3, # 8 Exhibit 4, # 9 Exhibit 5, # 10 Exhibit 6, # 11 Exhibit 7, # 12 Exhibit 8, # 13 Exhibit 9, # 14 Exhibit 10) (Harris, Alden) (Entered: 01/14/2022)
01/14/2022	74	Sealed Document: Additional Exhibits to Document No. 73 of 73 Sealed Motion RED ROCKS RESPONSE IN OPPOSITION TO DEFENDANTS MOTION TO TRANSFER VENUE by Red Rock Analytics, LLC by Red Rock Analytics, LLC (Attachments: # 1 Exhibit 12, # 2 Exhibit 13, # 3 Exhibit 14, # 4 Exhibit 15, # 5 Exhibit 16, # 6 Exhibit 17, # 7 Exhibit 18, # 8 Exhibit 19, # 9 Exhibit 20, # 10 Exhibit 21, # 11 Exhibit 22, # 12 Exhibit 23, # 13 Exhibit 24, # 14 Exhibit 25, # 15 Exhibit 26, # 16 Exhibit 27, # 17 Exhibit 28, # 18 Exhibit 29, # 19 Exhibit 30, # 20 Exhibit 31, # 21 Exhibit 32, # 22 Exhibit 33, # 23 Exhibit 34, # 24 Exhibit 35, # 25 Exhibit 36, # 26 Exhibit 37, # 27 Exhibit 38, # 28 Exhibit 39, # 29 Exhibit 40, # 30 Exhibit 41, # 31 Exhibit 42, # 32 Exhibit 43, # 33 Exhibit 44, # 34 Exhibit 45, # 35 Exhibit 46, # 36 Exhibit 47, # 37 Exhibit 48, # 38 Exhibit 49, # 39 Exhibit 50, # 40 Exhibit 51, # 41 Exhibit 52, # 42 Exhibit 53) (Harris, Alden) (Entered: 01/14/2022)
01/14/2022	75	Sealed Document: Additional Exhibits to Document No. 73 of 73 Sealed Motion RED ROCKS RESPONSE IN OPPOSITION TO DEFENDANTS MOTION TO TRANSFER VENUE by Red Rock Analytics, LLC by Red Rock Analytics, LLC (Attachments: # 1 Exhibit 55, # 2 Exhibit 56, # 3 Exhibit 57, # 4 Exhibit 58, # 5 Exhibit 59, # 6 Exhibit 60, # 7 Exhibit 61, # 8 Exhibit 62, # 9 Exhibit 63, # 10 Exhibit 64, # 11 Exhibit 65, # 12 Exhibit 66, # 13 Exhibit 67, # 14 Exhibit 68, # 15 Exhibit 69, # 16 Exhibit 70, # 17 Exhibit 71, # 18 Exhibit 72, # 19 Exhibit 73, # 20 Exhibit 74, # 21 Exhibit 75, # 22 Exhibit 76, # 23 Exhibit 77, # 24 Proposed Order Proposed Order) (Harris, Alden) (Entered: 01/14/2022)

01/21/2022	76	NOTICE <i>Joint Notice Regarding Deadline to Submit Redactions</i> by Red Rock Analytics, LLC (Harris, Alden) (Entered: 01/21/2022)
01/26/2022	77	ORDER, (Discovery Hearing set for 1/25/2022 03:45 PM before Judge Alan D Albright). Signed by Judge Alan D Albright. (bot1) (Entered: 01/26/2022)
01/26/2022	78	Opposed MOTION for Leave to File ***DEFENDANTS' OPPOSED MOTION FOR LEAVE TO FILE SUPPLEMENTAL CLAIM CONSTRUCTION BRIEF*** by Qualcomm, Inc.. (Attachments: # 1 Exhibit A, # 2 Exhibit B, # 3 Proposed Order)(Schuneman, Nick) (Entered: 01/26/2022)
01/26/2022	79	Sealed Document: Exhibit A to 78 <i>Opposed MOTION for Leave to File ***DEFENDANTS' OPPOSED MOTION FOR LEAVE TO FILE SUPPLEMENTAL CLAIM CONSTRUCTION BRIEF***</i> by Qualcomm, Inc. (Schuneman, Nick) (Entered: 01/26/2022)
01/27/2022	80	Minute Entry for proceedings held before Judge Alan D Albright: Discovery Hearing held on 1/27/2022. Case called for Discovery Hearing on private link. The parties argued their discovery issues. The Courtheard arguments and suggested that the parties meet and confer regarding their issues to see if they can come to an agreement. If not, then they may contact the Court again for another hearing. (Minute entry documents are not available electronically.). (Court Reporter Lily Reznik.) (jc5) (Entered: 01/27/2022)
01/28/2022	81	SCHEDULING ORDER: Markman Hearing set for 3/30/2022 09:00 AM before Judge Alan D Albright. Signed by Judge Alan D Albright. (jc5) (Entered: 01/28/2022)
01/28/2022	82	Unopposed MOTION to Withdraw as Attorney <i>S. Dennis Wang as counsel for Apple Inc.</i> by Apple Inc.. (Attachments: # 1 Proposed Order)(Ravel, J.) (Entered: 01/28/2022)
01/28/2022	83	NOTICE <i>Joint Notice Regarding Deadline to Submit Redactions</i> by Red Rock Analytics, LLC (Harris, Alden) (Entered: 01/28/2022)
02/02/2022	84	Response in Opposition to Motion, filed by Red Rock Analytics, LLC, <i>Red Rock's Response In Opposition to Defendant's Opposed Motion for Leave to File Supplemental Claim Construction Brief</i> (Attachments: # 1 Proposed Order)(Harris, Alden) (Entered: 02/02/2022)
02/04/2022	85	NOTICE <i>JOINT NOTICE REGARDING DEFENDANTS REPLY IN SUPPORT OF THEIR OPPOSED MOTION TO TRANSFER VENUE</i> by Red Rock Analytics, LLC re 45 MOTION to Transfer Case <i>Defendants Qualcomm Inc. and Apple Inc.'s Opposed Motion to Transfer Venue to the Northern District of California</i> (Harris, Alden) (Entered: 02/04/2022)
02/04/2022	86	NOTICE <i>Joint Notice Regarding Deadline to Submit Redactions</i> by Red Rock Analytics, LLC (Harris, Alden) (Entered: 02/04/2022)
02/09/2022	87	Sealed Document: DEFENDANTS' REPLY IN SUPPORT OF THEIR OPPOSED MOTION FOR LEAVE TO FILE SUPPLEMENTAL CLAIM CONSTRUCTION BRIEF by Qualcomm, Inc. (Attachments: # 1 Exhibit C) (Schuneman, Nick) (Entered: 02/09/2022)
02/09/2022	88	NOTICE of Filing Exhibit C to 87 Sealed Document: DEFENDANTS' REPLY IN SUPPORT OF THEIR OPPOSED MOTION FOR LEAVE TO FILE SUPPLEMENTAL CLAIM CONSTRUCTION BRIEF by Qualcomm, Inc. (Schuneman, Nick) (Entered: 02/09/2022)
02/11/2022	89	NOTICE <i>Joint Notice Regarding Deadline to Submit Redactions</i> by Red Rock Analytics, LLC (Harris, Alden) (Entered: 02/11/2022)
02/11/2022		Text Order GRANTING 82 Motion to Withdraw as Attorney entered by Judge Alan D Albright. IT IS THEREFORE ORDERED that S. Dennis Wang is withdrawn as counsel of record for Defendant Apple Inc. The Court directs the Clerk to remove S. Dennis Wang from the Court's CM/ECF service list as counsel of record for Defendant Apple Inc. (This is a text-only entry generated by the court. There is no document associated with this entry.) (RRlc) (Entered: 02/11/2022)
02/11/2022		Text Order DENYING 17 Motion to Dismiss as MOOT entered by Judge Alan D Albright in view of 31 Red Rock Analytics, LLC's First Amended Complaint for Patent Infringement. (This is a text-only entry generated by the court. There is no document associated with this entry.) (RRlc) (Entered: 02/11/2022)
02/16/2022	90	Redacted Copy ***DEFENDANTS' REPLY IN SUPPORT OF THEIR OPPOSED MOTION FOR LEAVE TO FILE SUPPLEMENTAL CLAIM CONSTRUCTION BRIEF*** of 87 Sealed Document by

		Qualcomm, Inc.. (Schuneman, Nick) (Entered: 02/16/2022)
02/17/2022	91	ORDER GRANTING 78 Motion for Leave to File. Signed by Judge Alan D Albright. (jc5) (Entered: 02/17/2022)
02/18/2022	92	NOTICE <i>Joint Notice Regarding Deadline to Submit Redactions</i> by Red Rock Analytics, LLC (Harris, Alden) (Entered: 02/18/2022)
02/18/2022	93	Sealed Document: Defendants' Supplemental Claim Construction Brief to Address Newly-Discovered Extrinsic Evidence by Qualcomm, Inc. (Attachments: # 1 Exhibit 19) (Schuneman, Nick) (Entered: 02/18/2022)
02/18/2022	94	Sealed Transcript filed (This transcript is not available electronically) (lr) (Entered: 02/18/2022)
02/25/2022	95	Redacted Copy ***DEFENDANTS' SUPPLEMENTAL CLAIM CONSTRUCTION BRIEF TO ADDRESS NEWLY-DISCLOSED EXTRINSIC EVIDENCE*** of 93 Sealed Document by Qualcomm, Inc.. (Attachments: # 1 Exhibit 19)(Schuneman, Nick) (Entered: 02/25/2022)
02/25/2022	96	Redacted Copy of 73 Sealed Motion RED ROCKS RESPONSE IN OPPOSITION TO DEFENDANTS MOTION TO TRANSFER VENUE by Red Rock Analytics, LLC by Red Rock Analytics, LLC. (Harris, Alden) (Entered: 02/25/2022)
02/28/2022	97	ORDER, (Markman Hearing RESET for 3/30/2022 01:30 PM before Judge Alan D Albright). Signed by Judge Alan D Albright. (bot1) (Entered: 02/28/2022)
02/28/2022	98	RESPONSE RED ROCK'S RESPONSE TO DEFENDANTS' SUPPLEMENTAL CLAIM CONSTRUCTION BRIEF to 93 Sealed Document by Red Rock Analytics, LLC. (Harris, Alden) (Entered: 02/28/2022)
03/02/2022	99	ORDER, (Discovery Hearing set for 3/4/2022 02:30 PM before Judge Alan D Albright). Signed by Judge Alan D Albright. (bot2) (Entered: 03/02/2022)
03/04/2022	100	Minute Entry for proceedings held before Judge Alan D Albright: Discovery Hearing held on 3/4/2022. Case called for Discovery Hearing by zoom. The Court heard argument from both parties regarding discovery issues. The Court made an oral ruling on the issues. The Court is denying the relief that the plaintiff is requesting. (Minute entry documents are not available electronically.). (Court Reporter Kristie Davis.) (jc5) (Entered: 03/04/2022)
03/04/2022	101	Sealed Document: SEALED Defendants Reply ISO 45 Motion to Transfer Venue to the NDCA of 45 MOTION to Transfer Case <i>Defendants Qualcomm Inc. and Apple Inc.'s Opposed Motion to Transfer Venue to the Northern District of California</i> by Apple Inc., Qualcomm, Inc. (Attachments: # 1 Sealed Document Guske Declaration, # 2 Sealed Document Selwyn Declaration, # 3 Sealed Document Exhibit A, # 4 Sealed Document Exhibit B, # 5 Sealed Document Exhibit C part 1, # 6 Sealed Document Exhibit C part 2, # 7 Sealed Document Exhibit C part 3, # 8 Sealed Document Exhibit D, # 9 Sealed Document Exhibit E, # 10 Sealed Document Exhibit F, # 11 Sealed Document Exhibit G, # 12 Sealed Document Exhibit H, # 13 Exhibit I, # 14 Sealed Document Exhibit J, # 15 Sealed Document Exhibit K, # 16 Sealed Document Exhibit L, # 17 Sealed Document Exhibit M, # 18 Sealed Document Exhibit N, # 19 Sealed Document Exhibit O, # 20 Sealed Document Exhibit P, # 21 Sealed Document Exhibit Q, # 22 Sealed Document Exhibit R, # 23 Sealed Document Exhibit S, # 24 Sealed Document Exhibit T, # 25 Sealed Document Exhibit U, # 26 Sealed Document Exhibit V, # 27 Sealed Document Exhibit W, # 28 Sealed Document Exhibit X, # 29 Sealed Document Exhibit Y, # 30 Sealed Document Exhibit AA, # 31 Sealed Document Exhibit BB, # 32 Exhibit CC, # 33 Exhibit DD, # 34 Exhibit EE, # 35 Exhibit FF, # 36 Exhibit GG, # 37 Exhibit HH, # 38 Exhibit II, # 39 Exhibit JJ) (Ravel, J.) (Entered: 03/04/2022)
03/04/2022	102	NOTICE of Filing Exhibits I, CC, DD, EE, FF, GG, HH, II & JJ by Apple Inc. re 101 Sealed Document,,,,, (Attachments: # 1 Exhibit CC, # 2 Exhibit DD, # 3 Exhibit EE, # 4 Exhibit FF, # 5 Exhibit GG, # 6 Exhibit HH, # 7 Exhibit II, # 8 Exhibit JJ)(Ravel, J.) (Entered: 03/04/2022)
03/07/2022	103	Joint Claim Construction Brief or Statement by Red Rock Analytics, LLC. (Harris, Alden) (Entered: 03/07/2022)
03/10/2022	104	Transcript filed of Proceedings held on 3-4-22, Proceedings Transcribed: Discovery Hearing (Zoom). Court Reporter/Transcriber: Kristie Davis (kmdaviscsr@yahoo.com), Telephone number: 254-340-6114. (kd) (Entered: 03/10/2022)

03/10/2022		<p>Parties shall comply with Judge Albright's updated standing orders and COVID-19 standing order available by clicking the included hyperlinks.</p> <p>The updated orders are as follows:</p> <ol style="list-style-type: none"> 1. Standing Order Regarding Notice of Readiness for Patent Cases 030722, 2. Standing Order on Pretrial Procedures and Requirements in Civil Cases 030722, 3. Standing Order Governing Proceedings 4.0 - Patent Cases 030722, 4. Amended Standing Order Regarding Coronavirus (COVID-19) and Court Proceedings, 5. Amended Standing Order Regarding Joint Or Unopposed Request To Change Deadlines 030722, 6. Amended Standing Order Regarding Filing Documents Under Seal and Redacted Public Versions 030722. (jkda) (Entered: 03/10/2022)
03/10/2022	105	MOTION to Appear Pro Hac Vice by Douglas M. Kubehl <i>Nick Baniel</i> (Filing fee \$ 100 receipt number 0542-15803630) by on behalf of Qualcomm, Inc.. (Attachments: # 1 Proposed Order)(Kubehl, Douglas) (Entered: 03/10/2022)
03/15/2022	106	ORDER GRANTING 105 Motion to Appear Pro Hac Vice for Attorney Nicholas A. Baniel. Attorney added for Qualcomm, Inc. Pursuant to our Administrative Policies and Procedures for Electronic Filing, the attorney hereby granted to practice pro hac vice in this case must register for electronic filing with our court within 10 days of this order, if he/she has not previously done so for a prior case in this District . Signed by Judge Alan D Albright. (bot3) (Entered: 03/15/2022)
03/18/2022	107	Redacted Public Version 101 SEALED Defs' Reply ISO 45 Motion to Transfer Venue to the NDCA of 101 Sealed Document,,,,,, by Apple Inc.. (Ravel, J.) (Entered: 03/18/2022)
03/25/2022	108	SCHEDULING ORDER: Markman Hearing set for 5/12/2022 01:30 PM before Judge Alan D Albright,. Signed by Judge Alan D Albright. (lad) (Entered: 03/25/2022)
03/31/2022	109	Sealed Document: Red Rock's Sur-Reply in Opposition to Defendants' Motion to Transfer Venue Under 28 USC § 1404(a) of 45 MOTION to Transfer Case <i>Defendants Qualcomm Inc. and Apple Inc.'s Opposed Motion to Transfer Venue to the Northern District of California</i> by Red Rock Analytics, LLC (Attachments: # 1 Supplemental Declaration of Ronald Murias in Support of Red Rock's Response in Opposition to Defendants' Motion to Transfer Venue Under 28 U.S.C. § 1404(a), # 2 Declaration of Alden G. Harris in Support of Red Rock's Sur-Reply in Opposition to Defendants Qualcomm, Inc. and Apple Inc.'s Motion to Transfer Venue, # 3 Exhibit 78, # 4 Exhibit 79, # 5 Exhibit 80, # 6 Exhibit 81, # 7 Exhibit 82, # 8 Exhibit 83, # 9 Exhibit 84, # 10 Exhibit 85, # 11 Exhibit 86, # 12 Exhibit 87, # 13 Exhibit 88, # 14 Exhibit 89, # 15 Exhibit 90, # 16 Exhibit 91, # 17 Exhibit 92, # 18 Exhibit 93, # 19 Exhibit 94) (Harris, Alden) (Entered: 03/31/2022)
04/07/2022	110	NOTICE <i>Joint Notice of Extension of Redaction Deadline</i> by Red Rock Analytics, LLC re 109 Sealed Document,,,, (Harris, Alden) (Entered: 04/07/2022)
04/14/2022	111	Standing Order Regarding Order Governing Proceedings Patent Cases. Signed by Judge Alan D Albright. (Entered: 04/14/2022)
04/14/2022	112	Sealed Document: Sur-Sur-Reply ISO Motion to Transfer Venue to the northern District of California of 45 MOTION to Transfer Case <i>Defendants Qualcomm Inc. and Apple Inc.'s Opposed Motion to Transfer Venue to the Northern District of California</i> by Apple Inc., Qualcomm, Inc. (Attachments: # 1 Affidavit Schuneman ISO Sur-Sur-Reply, # 2 Exhibit KK ISO Sur-Sur-Reply, # 3 Exhibit LL ISO Sur-Sur-Reply) (Schuneman, Nick) (Entered: 04/14/2022)
04/14/2022	113	STATUS REPORT <i>Pursuant to Second Amended Standing Order Regarding Motions For Inter-District Transfer</i> by Apple Inc., Qualcomm, Inc.. (Schuneman, Nick) (Entered: 04/14/2022)
04/15/2022	114	NOTICE <i>Joint Notice of Extension of Redaction Deadline</i> by Red Rock Analytics, LLC re 109 Sealed Document,,,, (Harris, Alden) (Entered: 04/15/2022)
04/20/2022	115	ORDER, (Markman Hearing RESET for 6/9/2022 01:30 PM before Judge Alan D Albright). Signed by Judge Alan D Albright. (bot3) (Entered: 04/20/2022)
04/21/2022	116	Redacted Copy of 109 Sealed Document,,,, by Red Rock Analytics, LLC. (Harris, Alden) (Entered: 04/21/2022)
04/21/2022	117	NOTICE <i>Joint Notice Regarding Deadline to Submit Redactions</i> by Apple Inc. (Ravel, J.) (Entered: 04/21/2022)

04/25/2022	118	MOTION <i>PLAINTIFF'S MOTION TO DE-DESIGNATE REDACTED EXPERT DECLARATIONS</i> by Red Rock Analytics, LLC. (Attachments: # 1 Declaration of Alden Harris, # 2 Proposed Order)(Harris, Alden) (Entered: 04/25/2022)
04/25/2022	119	Sealed Document: <i>ADDITIONAL EXHIBITS</i> of 118 MOTION <i>PLAINTIFF'S MOTION TO DE-DESIGNATE REDACTED EXPERT DECLARATIONS</i> by Red Rock Analytics, LLC (Attachments: # 1 Exhibit 2, # 2 Exhibit 3, # 3 Exhibit 4, # 4 Exhibit 5) (Harris, Alden) (Entered: 04/25/2022)
04/28/2022	120	NOTICE <i>Joint Notice Regarding Deadline to Submit Technical Tutorials</i> by Red Rock Analytics, LLC (Harris, Alden) (Entered: 04/28/2022)
04/28/2022	121	Redacted Copy *** <i>Sur-Sur-Reply ISO Motion to Transfer Venue to the northern District of California of 45 MOTION to Transfer Case Defendants Qualcomm Inc. and Apple Inc.'s Opposed Motion to Transfer Venue to the Northern District of California</i> *** of 112 Sealed Document, by Apple Inc., Qualcomm, Inc.. (Schuneman, Nick) (Entered: 04/28/2022)
05/02/2022	122	Response in Opposition to Motion, filed by Apple Inc., Qualcomm, Inc., re 118 MOTION <i>PLAINTIFF'S MOTION TO DE-DESIGNATE REDACTED EXPERT DECLARATIONS</i> filed by Plaintiff Red Rock Analytics, LLC (Attachments: # 1 Proposed Order)(Guske, Sarah) (Entered: 05/02/2022)
05/03/2022	123	ORDER REFERRING CASE to Magistrate Judge Derek T. Gilliland. Signed by Judge Alan D Albright. Referral Magistrate Judge: Derek T. Gilliland. (bot1) (Entered: 05/03/2022)
05/04/2022	124	Redacted Copy <i>Exhibit D (Unsealed Copy)</i> of 101 Sealed Document,,,,,, by Apple Inc., Qualcomm, Inc.. (Guske, Sarah) (Entered: 05/04/2022)
05/04/2022	125	Redacted Copy <i>Exhibit I (Unsealed Copy)</i> of 101 Sealed Document,,,,,, by Apple Inc., Qualcomm, Inc.. (Guske, Sarah) (Entered: 05/04/2022)
05/04/2022	126	Redacted Copy <i>Exhibit LL (Unsealed Copy)</i> of 112 Sealed Document, by Apple Inc., Qualcomm, Inc.. (Guske, Sarah) (Entered: 05/04/2022)
05/09/2022	127	REPLY to Response to Motion, filed by Red Rock Analytics, LLC, re 118 MOTION <i>PLAINTIFF'S MOTION TO DE-DESIGNATE REDACTED EXPERT DECLARATIONS</i> filed by Plaintiff Red Rock Analytics, LLC (Harris, Alden) (Entered: 05/09/2022)
05/20/2022	128	NOTICE <i>Joint Notice Regarding Deadline to Submit Technical Tutorials</i> by Red Rock Analytics, LLC (Harris, Alden) (Entered: 05/20/2022)
05/25/2022	129	ORDER, (Markman Hearing RESET for 6/16/2022 01:30 PM before Judge Alan D Albright). Signed by Judge Alan D Albright. (bot2) (Entered: 05/25/2022)
06/13/2022	130	ORDER STAYING CASE, pending resolution of the Motion for Transfer at 45 . Markman hearing set for June 16, 2022 is hereby VACATED.Signed by Judge Alan D Albright. (lad) (Entered: 06/13/2022)
09/08/2022	131	ORDER OF RECUSAL. Signed by Judge Derek T. Gilliland. (zv) (Entered: 09/08/2022)
09/08/2022		CASE NO LONGER REFERRED to Magistrate Judge Derek T. Gilliland. (zv) (Entered: 09/08/2022)
09/13/2022	132	NOTICE of Attorney Appearance by Jeffery S. Becker on behalf of Qualcomm, Inc. (Becker, Jeffery) (Entered: 09/13/2022)
09/13/2022	133	NOTICE of Attorney Appearance by Joseph Andrew Grado on behalf of Qualcomm, Inc. (Grado, Joseph) (Entered: 09/13/2022)
09/15/2022	134	Unopposed MOTION to Withdraw as Attorney *** <i>UNOPPOSED MOTION TO WITHDRAW APPEARANCE OF NICK SCHUNEMAN AS COUNSEL FOR DEFENDANT QUALCOMM INCORPORATED</i> *** by Qualcomm, Inc.. (Attachments: # 1 Proposed Order)(Becker, Jeffery) (Entered: 09/15/2022)
09/15/2022	135	Unopposed MOTION to Withdraw as Attorney *** <i>UNOPPOSED MOTION TO WITHDRAW APPEARANCE OF AASHISH KAPADIA AS COUNSEL FOR DEFENDANT QUALCOMM INCORPORATED</i> *** by Qualcomm, Inc.. (Attachments: # 1 Proposed Order)(Becker, Jeffery) (Entered: 09/15/2022)

09/16/2022		<p>Parties shall comply with Judge Albright's updated standing orders available by clicking the included hyperlinks.</p> <p>The updated orders are as follows:</p> <ol style="list-style-type: none"> 1. Standing Order Governing Proceedings Patent Cases, 2. Amended Standing Order On Pretrial Procedures and Requirements in Civil Cases. <p>(bot4) (Entered: 09/17/2022)</p>
11/30/2022	136	NOTICE OF SUPPLEMENTAL AUTHORITY by Red Rock Analytics, LLC re 45 MOTION to Transfer Case <i>Defendants Qualcomm Inc. and Apple Inc.'s Opposed Motion to Transfer Venue to the Northern District of California</i> (Attachments: # 1 Exhibit A)(Harris, Alden) (Entered: 11/30/2022)
12/02/2022	137	Opposed Sealed Motion <i>FOR LEAVE TO FILE SUPPLEMENTAL BRIEF OPPOSING DEFENDANTS MOTION TO TRANSFER VENUE UNDER 28 U.S.C. § 1404(a)</i> by Red Rock Analytics, LLC (Attachments: # 1 Exhibit A - Red Rock's Supplemental Brief Opposing Defendants' Motion to Transfer Venue Under 28 U.S.C. § 1404(a), # 2 Proposed Order) (Harris, Alden) (Entered: 12/02/2022)
12/02/2022	138	DEFICIENCY NOTICE: re 137 Opposed Sealed Motion <i>FOR LEAVE TO FILE SUPPLEMENTAL BRIEF OPPOSING DEFENDANTS MOTION TO TRANSFER VENUE UNDER 28 U.S.C. § 1404(a)</i> by Red Rock Analytics, LLC (lad) (Entered: 12/02/2022)
12/02/2022	139	ATTACHMENT <i>Amended Certificate of Service</i> to 137 Opposed Sealed Motion <i>FOR LEAVE TO FILE SUPPLEMENTAL BRIEF OPPOSING DEFENDANTS MOTION TO TRANSFER VENUE UNDER 28 U.S.C. § 1404(a)</i> by Red Rock Analytics, LLC by Red Rock Analytics, LLC. (Harris, Alden) (Entered: 12/02/2022)
12/09/2022	140	Redacted Copy of 137 Opposed Sealed Motion <i>FOR LEAVE TO FILE SUPPLEMENTAL BRIEF OPPOSING DEFENDANTS MOTION TO TRANSFER VENUE UNDER 28 U.S.C. § 1404(a)</i> by Red Rock Analytics, LLC by Red Rock Analytics, LLC. (Attachments: # 1 Exhibit A - Red Rock's Supplemental Brief Opposing Defendants' Motion to Transfer Venue Under 28 U.S.C. § 1404(a), # 2 Proposed Order)(Harris, Alden) (Entered: 12/09/2022)
12/09/2022	141	Sealed Document: <i>Defendants Apple Inc. and Qualcomm, Inc.'s Sealed Response to Plaintiff's Motion for Leave to File Supplemental Briefing</i> of 137 Opposed Sealed Motion <i>FOR LEAVE TO FILE SUPPLEMENTAL BRIEF OPPOSING DEFENDANTS MOTION TO TRANSFER VENUE UNDER 28 U.S.C. § 1404(a)</i> by Red Rock Analytics, LLC by Apple Inc., Qualcomm, Inc. (Attachments: # 1 Proposed Order Proposed Order) (Ravel, J.) (Entered: 12/09/2022)
12/15/2022	142	Redacted Public Version of 141 Sealed Document, by Apple Inc., Qualcomm, Inc.. (Ravel, J.) (Entered: 12/15/2022)
12/16/2022	143	Sealed Document: Red Rock's Reply In Support of 137 Opposed Sealed Motion <i>FOR LEAVE TO FILE SUPPLEMENTAL BRIEF OPPOSING DEFENDANTS MOTION TO TRANSFER VENUE UNDER 28 U.S.C. § 1404(a)</i> by Red Rock Analytics, LLC by Red Rock Analytics, LLC (Harris, Alden) (Entered: 12/16/2022)
12/20/2022		Text Order GRANTING 137 Sealed Motion for Leave to File Supplemental Brief. Defendants may file a responsive brief not to exceed three pages by January 6, 2023. Entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (RJlc) (Entered: 12/20/2022)
12/20/2022		Text Order GRANTING 134 Motion to Withdraw as Attorney. Noting that it is unopposed, the Court GRANTS the Motion. It is therefore ORDERED that Nick Schuneman is withdrawn as counsel for Defendant Qualcomm Incorporated. It is further ORDERED that the docket be amended to reflect that Nick Schuneman has withdrawn as counsel for Defendant and no longer needs to be noticed of any pleadings, motions, or other documents filed or served in this case. Entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (RJlc) (Entered: 12/20/2022)
12/20/2022		Text Order GRANTING 135 Motion to Withdraw as Attorney. Noting that it is unopposed, the Court GRANTS the Motion. It is therefore ORDERED that Aashish Kapadia is withdrawn as counsel for Defendant Qualcomm Incorporated. It is further ORDERED that the docket be amended to reflect that Aashish Kapadia has withdrawn as counsel for Defendant and no longer needs to be noticed of any

		pleadings, motions, or other documents filed or served in this case. Entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (RJlc) (Entered: 12/20/2022)
12/23/2022	144	Redacted Copy (143 Red Rock's Reply In Support of 137 Opposed Sealed Motion FOR LEAVE TO FILE SUPPLEMENTAL BRIEF OPPOSING DEFENDANTS MOTION TO TRANSFER VENUE UNDER 28 U.S.C. § 1404(a)) of 143 Sealed Document, by Red Rock Analytics, LLC. (Harris, Alden) (Entered: 12/23/2022)
01/06/2023	145	Sealed Document: <i>Defendants' Sealed Brief in Response of 137 Opposed Sealed Motion FOR LEAVE TO FILE SUPPLEMENTAL BRIEF OPPOSING DEFENDANTS MOTION TO TRANSFER VENUE UNDER 28 U.S.C. § 1404(a)</i> by Red Rock Analytics, LLC by Apple Inc., Qualcomm, Inc., Sealed Motion <i>Defendants' Sealed Brief in Response to Plaintiff's Supplemental Brief (Dkt. 137-1) and in Support of Their Motion to Transfer Venue to the Northern District of California</i> by Apple Inc., Qualcomm, Inc. (Ravel, J.) (Entered: 01/06/2023)
01/13/2023	146	Redacted Public Version of 137 Opposed Sealed Motion FOR LEAVE TO FILE SUPPLEMENTAL BRIEF OPPOSING DEFENDANTS MOTION TO TRANSFER VENUE UNDER 28 U.S.C. § 1404(a) by Red Rock Analytics, LLC by Apple Inc.. (Ravel, J.) (Entered: 01/13/2023)
01/13/2023	147	Sealed Document: Red Rock's Reply In Support of 137 Opposed Sealed Motion FOR LEAVE TO FILE SUPPLEMENTAL BRIEF OPPOSING DEFENDANTS MOTION TO TRANSFER VENUE UNDER 28 U.S.C. § 1404(a) by Red Rock Analytics, LLC by Red Rock Analytics, LLC, Sealed Motion Red Rock's Reply In Support of <i>Its Supplemental Brief (DKT. 137-1) Opposing Defendants' Motion to Transfer Venue Under 28 U.S.C. § 1404(a)</i> by Red Rock Analytics, LLC (Harris, Alden) (Entered: 01/13/2023)
01/20/2023	148	Redacted Copy - PUBLIC VERSION of 147 Sealed Motion Red Rock's Reply In Support of <i>Its Supplemental Brief (DKT. 137-1) Opposing Defendants' Motion to Transfer Venue Under 28 U.S.C. § 1404(a)</i> by Red Rock Analytics, LLC by Red Rock Analytics, LLC. (Harris, Alden) (Entered: 01/20/2023)
03/16/2023	149	NOTICE of Attorney Appearance by Steven J. Wingard on behalf of Apple Inc.. Attorney Steven J. Wingard added to party Apple Inc.(pty:dft) (Wingard, Steven) (Entered: 03/16/2023)
03/16/2023	150	NOTICE of Attorney Appearance by Stephen Burbank on behalf of Apple Inc.. Attorney Stephen Burbank added to party Apple Inc.(pty:dft) (Burbank, Stephen) (Entered: 03/16/2023)
03/16/2023	151	NOTICE of Attorney Appearance by Robert Pierce Earle on behalf of Apple Inc.. Attorney Robert Pierce Earle added to party Apple Inc.(pty:dft) (Earle, Robert) (Entered: 03/16/2023)
04/04/2023		Parties shall comply with Judge Albright's updated Standing Order Governing Proceedings - Patent Cases available by clicking the hyperlink. (bot2) (Entered: 04/05/2023)
04/14/2023	152	Unopposed MOTION for Leave to File Red Rock's Second Supplemental Brief Opposing Defendants' Motion to Transfer Venue Under 28 U.S.C. § 1404(a) by Red Rock Analytics, LLC. (Attachments: # 1 Red Rock's Second Supplemental Brief Opposing Defendants' Motion to Transfer Venue Under 28 U.S.C. § 1404(a), # 2 Exhibit A, # 3 Proposed Order)(Harris, Alden) (Entered: 04/14/2023)
04/17/2023		Text Order GRANTING 152 Motion for Leave to File. Having considered Red Rock's Unopposed Motion for Leave to File Second Supplemental Brief, and noting that the motion is unopposed, the motion is hereby GRANTED. Red Rock's Second Supplemental Brief Opposing Defendants' Motion to Transfer is deemed filed. Defendants may file a responsive brief not to exceed two pages by April 28, 2023. Entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (MSlc) (Entered: 04/17/2023)
04/18/2023	153	Red Rock's Second Supplemental BRIEF regarding Defendant's Motion to Transfer Venue. (Attachments: # 1 Exhibit Exhibit A)(sm3) (Entered: 04/19/2023)
04/28/2023	154	RESPONSE in Support, filed by Apple Inc., re 45 MOTION to Transfer Case <i>Defendants Qualcomm Inc. and Apple Inc.'s Opposed Motion to Transfer Venue to the Northern District of California</i> filed by Defendant Qualcomm, Inc. [DEFENDANTS RESPONSE TO PLAINTIFFS SECOND SUPPLEMENTAL BRIEF (DKT. 153) REGARDING DEFENDANTS MOTION TO TRANSFER

		<i>VENUE TO THE NORTHERN DISTRICT OF CALIFORNIA</i>] (Wingard, Steven) (Entered: 04/28/2023)
05/23/2023		Parties shall comply with Judge Albright's updated Standing Orders: Order Regarding Court Docket Management and Amended Standing Order for Pretrial Procedure . Both orders are available by clicking the hyperlink. (bot2) (Entered: 05/24/2023)
06/27/2023	155	Unopposed MOTION for Leave to File Red Rock's Third Supplemental Brief Opposing Defendants' Motion to Transfer Venue Under 28 U.S.C. § 1404(a) by Red Rock Analytics, LLC. (Attachments: # 1 Red Rock's Third Supplemental Brief Opposing Defendants' Motion to Transfer Venue, # 2 Proposed Order)(Harris, Alden) Modified on 6/27/2023 (lad). (Entered: 06/27/2023)
07/31/2023	156	NOTICE of Change of Address by Alden G. Harris (Harris, Alden) (Entered: 07/31/2023)
01/23/2024		Parties shall comply with Judge Albright's updated Standing Order Governing Proceedings - Patent Cases available by clicking the hyperlink. (bot1) (Entered: 01/25/2024)
02/28/2024	157	MOTION to Withdraw as Attorney (<i>Anh-Khoa Tran</i>) by Apple Inc.. (Attachments: # 1 Proposed Order on Motion to Withdraw)(Wingard, Steven) (Entered: 02/28/2024)
02/29/2024		Text Order GRANTING 157 Motion to Withdraw as Attorney. entered by Judge Alan D Albright. Came on for consideration is Defendant's Motion to Allow Anh-Khoa Tran (Mr. Tran) to Withdraw As Counsel. Noting that it is unopposed, the Court GRANTS the motion. It is therefore ORDERED that Mr. Tran is hereby withdrawn as counsel of record for Defendant. It is further ORDERED that the docket be amended to reflect that Mr. Tran has withdrawn as counsel for Defendant and that he no longer needs to be noticed of any pleadings, motions, or other documents filed or served in this case. (This is a text-only entry generated by the court. There is no document associated with this entry.) (kylc) (Entered: 02/29/2024)
03/01/2024	158	ORDER GRANTING 155 Motion for Leave to File Third Supplemental Brief. Signed by Judge Alan D Albright. (lad) (Entered: 03/01/2024)
03/01/2024	159	RED ROCKS THIRD SUPPLEMENTAL BRIEF REGARDING 45 MOTION to Transfer Case <i>Defendants Qualcomm Inc. and Apple Inc.'s Opposed Motion to Transfer Venue to the Northern District of California</i> by Red Rock Analytics, LLC. (lad) (Entered: 03/01/2024)
03/14/2024	160	Unopposed MOTION for Leave to File Red Rock's Fourth Supplemental Brief Opposing Defendants' Motion to Transfer Venue by Red Rock Analytics, LLC. (Attachments: # 1 Red Rock's Fourth Supplemental Brief Opposing Defendants' Motion to Transfer Venue, # 2 Proposed Order)(Harris, Alden) (Entered: 03/14/2024)
03/15/2024	161	ORDER GRANTING 160 Motion for Leave to File. Signed by Judge Alan D Albright. (lad) (Entered: 03/15/2024)
03/15/2024	162	RED ROCKS FOURTH SUPPLEMENTAL BRIEF REGARDING 45 DEFENDANTS MOTION to Transfer Case <i>Defendants Qualcomm Inc. and Apple Inc.'s Opposed Motion to Transfer Venue to the Northern District of California</i> by Red Rock Analytics, LLC. (lad) (Entered: 03/15/2024)
03/15/2024	163	RESPONSE FROM DEFENDANTS to 162 Brief, 159 Brief by Apple Inc.. (Wingard, Steven) (Entered: 03/15/2024)
03/15/2024	164	RESPONSE CORRECTED from Defendants to 162 Brief, 159 Brief by Apple Inc.. (Wingard, Steven) (Entered: 03/15/2024)
09/13/2024	165	Unopposed Sealed Motion Unopposed Motion for Leave to File Fifth Supplemental Brief Opposing Defendants' Motion to Transfer Venue Under 28 USC 1404(a) by Red Rock Analytics, LLC (Attachments: # 1 Supplement, # 2 Proposed Order) (Harris, Alden) (Entered: 09/13/2024)
09/16/2024		Text Order GRANTING 165 Motion for Leave to File Fifth Supplemental Brief Opposing Defendants' Motion to Transfer Venue entered by Judge Alan D Albright. Noting that the Motion is unopposed, the Motion is GRANTED. (This is a text-only entry generated by the court. There is no document associated with this entry.) (cb1c) (Entered: 09/16/2024)

09/16/2024	166	Sealed Document filed : RED ROCKS FIFTH SUPPLEMENTAL BRIEF OPPOSING 45 DEFENDANTS MOTION TO TRANSFER VENUE UNDER 28 U.S.C. § 1404(a) (lad) (Entered: 09/16/2024)
09/20/2024	167	Redacted Copy of 165 Unopposed Sealed Motion Unopposed Motion for Leave to File Fifth Supplemental Brief Opposing Defendants' Motion to Transfer Venue Under 28 USC 1404(a) by Red Rock Analytics, LLC by Red Rock Analytics, LLC. (Attachments: # 1 Supplement, # 2 Proposed Order)(Harris, Alden) (Entered: 09/20/2024)
09/27/2024	168	RESPONSE TO PLAINTIFFS FIFTH SUPPLEMENTAL BRIEF (DKT. 166) REGARDING DEFENDANTS MOTION TO TRANSFER VENUE TO THE NORTHERN DISTRICT OF CALIFORNIA to 166 Sealed Document by Apple Inc., Qualcomm, Inc.. (Wingard, Steven) (Entered: 09/27/2024)
11/11/2024	169	Unopposed MOTION to Withdraw as Attorney (<i>Henry Nikogosyan</i>) by Apple Inc.. (Attachments: # 1 Proposed Order)(Nikogosyan, Henry) (Entered: 11/11/2024)
11/25/2024		Text Order GRANTING 169 Motion to Withdraw Henry Nikogosyan as Attorney. Entered by Judge Alan D Albright. (This is a text-only entry generated by the court. There is no document associated with this entry.) (cblc) (Entered: 11/25/2024)
02/12/2025	170	Sealed Order DENYING 45 MOTION to Transfer Case. Signed by Judge Alan D Albright. (lad) (Entered: 02/12/2025)
02/28/2025	171	Joint MOTION to Lift Stay <i>and for Entry of Agreed Scheduling Order</i> by Red Rock Analytics, LLC. (Attachments: # 1 Proposed Order (Fourth Amended Agreed Scheduling Order))(Harris, Alden). Added MOTION for Entry of Scheduling Order Deadlines on 2/28/2025 (lad). (Entered: 02/28/2025)
03/04/2025	172	Redacted Copy of 170 Sealed Order Denying Transfer. (lad) (Entered: 03/04/2025)
03/04/2025	173	ORDER GRANTING 171 Motion to Lift Stay and for Entry of Scheduling Order. Markman Hearing set for 4/24/2025 10:00 AM before Judge Alan D Albright, Joinder of Parties due by 6/9/2025, Amended Pleadings due by 8/18/2025, Consent to Trial by Magistrate due by 2/2/2026, Dispositive/Daubert Motions due by 2/2/2026, Pretrial Conference set for 4/6/2026 before Judge Alan D Albright, Jury Selection set for 4/27/2026 before Judge Derek T. Gilliland, Jury Trial set for 4/27/2026 before Judge Alan D Albright. Signed by Judge Alan D Albright. (lad) (Entered: 03/04/2025)
03/04/2025		Case No Longer Stayed (lad) (Entered: 03/04/2025)
03/05/2025	174	NOTICE of Attorney Appearance by Nolan Edward Sullivan McQueen on behalf of Qualcomm, Inc.. Attorney Nolan Edward Sullivan McQueen added to party Qualcomm, Inc.(pty:dft) (McQueen, Nolan) (Entered: 03/05/2025)
03/13/2025	175	Unopposed MOTION to Withdraw as Attorney " <i>Unopposed Motion to Withdraw Sarah Guske as Counsel for Defendant Qualcomm Incorporated</i> " by Qualcomm, Inc.. (Attachments: # 1 Proposed Order)(Kubehl, Douglas) (Entered: 03/13/2025)

PACER Service Center			
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03/16/2025 04:04:30			
PACER Login:	bbpalsfo	Client Code:	081542.0116/soboleva
Description:	Docket Report	Search Criteria:	6:21-cv-00346-ADA
Billable Pages:	22	Cost:	2.20

3. Red Rock is informed and believes, and on that basis alleges, that Defendant Qualcomm is a California corporation with its principal place of business at 5775 Morehouse Dr., San Diego, CA 92121. Qualcomm may be served with process through its registered agent, Prentice Hall Corp. System, 211 E. 7th Street, Suite 620, Austin, TX 78701-3218 USA.

4. A true and correct copy of the patent asserted in this lawsuit, United States Patent No. 7,346,313 (“the ’313 Patent”) together with its certificates of correction are attached as Exhibit A.

5. Red Rock’s Preliminary Infringement Claim Chart for U.S. Patent No. 7,346,313 is attached as Exhibit B.

6. Red Rock’s prior Infringement Contention Claim Chart, which Red Rock served on Apple in Eastern District of Texas Civil Action No. 2:19-cv-00117-JRG (“*Apple I*”) on June 17, 2019, is attached as Exhibit C.

JURISDICTION AND VENUE

7. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a) because this action arises under the patent laws of the United States, 35 U.S.C. §§ 101 *et seq.*

8. The Court has personal jurisdiction over Defendant Apple, in part because Defendant Apple has minimum contacts within the State of Texas; Defendant Apple has purposefully availed itself of the privileges of conducting business in the State of Texas; Defendant Apple regularly conducts business within the State of Texas; and Plaintiff’s cause of action arises directly from Defendant Apple’s business contacts and other activities in the State of Texas, including at least by virtue of Defendant Apple’s infringing systems, devices, and methods, which are at least sold, practiced, and/or used in the State of Texas. Further, this Court has general jurisdiction over Defendant Apple, in part due to its continuous and systematic contacts with the State of Texas. Further, on information and belief, Defendant Apple is subject to the Court’s jurisdiction, in part because Defendant Apple has committed patent infringement in the State of Texas. Defendant

Apple has regular and established places of business in this district and regularly sells, markets, and supports its products and services within this judicial district. Defendant Apple is subject to this Court's specific and general personal jurisdiction pursuant to due process and/or the Texas Long Arm Statute, due at least to its substantial and pervasive business in this State and judicial district, including: (i) at least part of its infringing activities alleged herein; and (ii) regularly doing or soliciting business, engaging in other persistent conduct, and/or deriving substantial revenue from goods sold and services provided to Texas residents.

9. The Court has personal jurisdiction over Defendant Qualcomm, in part because Defendant Qualcomm has minimum contacts within the State of Texas; Defendant Qualcomm has purposefully availed itself of the privileges of conducting business in the State of Texas; Defendant Qualcomm regularly conducts business within the State of Texas; and Plaintiff's cause of action arises directly from Defendant Qualcomm's business contacts and other activities in the State of Texas, including at least by virtue of Defendant Qualcomm's infringing systems, devices, and methods, which are at least sold, practiced, and/or used in the State of Texas. Further, this Court has general jurisdiction over Defendant Qualcomm, in part due to its continuous and systematic contacts with the State of Texas. Further, on information and belief, Defendant Qualcomm is subject to the Court's jurisdiction, in part because Defendant Qualcomm has committed patent infringement in the State of Texas. Defendant Qualcomm has regular and established places of business in this district and regularly sells, markets, and supports its products and services within this judicial district. Defendant Qualcomm is subject to this Court's specific and general personal jurisdiction pursuant to due process and/or the Texas Long Arm Statute, due at least to its substantial and pervasive business in this State and judicial district, including: (i) at least part of its infringing activities alleged herein; and (ii) regularly doing or soliciting business, engaging in

other persistent conduct, and/or deriving substantial revenue from goods sold and services provided to Texas residents.

10. Venue is proper in this federal district as to Apple pursuant to 28 U.S.C. §§1391(b)-(c) and 1400(b). Without limitation, Defendant Apple has regular and established places of business in this District, and in Texas, and at least some of its infringement of the patent-in-suit occurs in this District, and in Texas.

11. Venue is proper in this federal district as to Qualcomm pursuant to 28 U.S.C. §§1391(b)-(c) and 1400(b). Without limitation, Defendant Qualcomm has regular and established places of business in this District, and in Texas, and at least some of its infringement of the patent-in-suit occurs in this District, and in Texas.

12. Without limitation, venue is proper in this District as to Apple because Defendant Apple has physical places from which its business is conducted within this District. Plaintiff is informed and believes, and on that basis alleges, that Apple maintains an office at 12545 Riata Vista Cir., Austin, TX 78727. Plaintiff is further informed and believes, and on that basis alleges, that Apple operates a number of retail stores in this District through which it transacts business. This includes Apple retail stores located at 3121 Palm Way, Austin, TX 78758 and 2901 S. Capital of Texas Hwy, Austin TX 78746. *See Find Locations*, Apple, <https://locate.apple.com/sales/> (last visited Mar. 25, 2021). The business conducted at such places is steady, uniform, orderly, and/or methodical, and is settled and not transient, including, but not limited to, distribution, sales, and/or offers for sale of infringing products. Further, on information and belief, Defendant Apple is subject to venue in this District, in part because Defendant Apple has committed patent infringement in this District. Pursuant to 35 U.S.C. § 271, Defendant Apple infringes the patent-in-suit by the infringing acts described herein in this District. Further, Defendant Apple solicits

and induces customers/users in this District, including via its stores and website at www.apple.com. On information and belief, Defendant Apple has customers/users who are residents of this District and who purchase, acquire, and/or use Defendant Apple's infringing products in this District.

13. Without limitation, venue is proper in this District as to Qualcomm because Defendant Qualcomm has physical places from which its business is conducted within this District. Plaintiff is informed and believes, and on that basis alleges, that Qualcomm maintains an office at 9600 N. Mopac Expy, Stonebridge Plaza II, Ste 900, Austin, TX 78759. The business conducted here is steady, uniform, orderly, and/or methodical, and is settled and not transient, including, but not limited to, distribution, sales, and/or offers for sale of infringing products. Further, on information and belief, Defendant Qualcomm is subject to venue in this District, in part because Defendant Qualcomm has committed patent infringement in this District. Pursuant to 35 U.S.C. § 271, Defendant Qualcomm infringes the patent-in-suit by the infringing acts described herein in this District. On information and belief, Defendant Qualcomm has customers/users who are residents of this District and who purchase, acquire, and/or use Defendant Qualcomm's infringing products in this District.

JOINDER OF DEFENDANTS

14. Joinder of accused infringers Apple and Qualcomm as defendants in this lawsuit is proper under 35 U.S.C. § 299.

15. Red Rock asserts that (a) it is entitled to relief against Defendants jointly, severally, and/or in the alternative with respect to or arising out of the same transaction, occurrence, or series of transactions or occurrences relating to the making, using, importing into the United States, offering for sale, or selling of the same accused product or process, and (b) questions of fact common to both Defendants will arise in the action.

16. Plaintiff alleges that Apple and Qualcomm manufacture and/or sell and/or offer for sale and/or import the same products and processes accused in this action concerning Qualcomm's 5G Infringing Products, including at least the SDR865, SDX55M, and/or SMR526, which are integrated into and sold as part of Apple's products, including at least the iPhone 12, iPhone 12 mini, iPhone 12 Pro, and iPhone 12 Pro Max.

INFRINGEMENT OF U.S. PATENT NO. 7,346,313 BY APPLE

17. On March 18, 2008, United States Patent No. 7,346,313 was duly and legally issued for inventions entitled "Calibration of I-Q Balance in Transceivers." Red Rock was assigned the '313 Patent and continues to hold all rights and interest in the '313 Patent.

18. The '313 Patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code.

19. On information and belief and pursuant to 35 U.S.C. § 271(a), Apple has directly infringed and continues to directly infringe numerous claims of the '313 Patent, including at least claims 7, 8, 11, 12, 15, 16, 17, 18, 21, 22, 23, 26, 27, 30, 32, 33, 34, 37, 44, 45, 48, 49, 52, 53, 54, 55, 58, 59, 60, 63, 64, 67, 69, 70, 71, and 74 by its manufacture, use, sale, importation, and/or offer for sale of products (*e.g.*, computers, cellular phones, tablets, watches) that include 5G wireless transceivers (the "Apple Infringing Products" or the "Apple Accused Products"). The Apple Infringing Products include the iPhone 12, iPhone 12 mini, iPhone 12 Pro, and iPhone 12 Pro Max. Based on Apple's public statements and third party analyses of Apple's products, the Apple Infringing Products include, for example, 5G wireless transceivers made by Qualcomm Inc. that comply in whole or in part with 3GPP release 15 and/or later releases. These 5G wireless transceivers include Qualcomm's SDR865, SDX55M, and/or SMR526. On the basis of information and belief, the 5G wireless transceivers in the Apple Infringing Products infringe the systems and methods claimed by the '313 Patent.

20. In this lawsuit, Red Rock does not accuse Apple of infringement with respect to any IEEE 802.11 transceivers in the Apple Infringing Products.

21. Red Rock hereby incorporates by reference Exhibit B to this Complaint. Exhibit B sets forth additional evidence and allegations supporting Red Rock's Patent Infringement Claims against Apple.

22. Defendant Apple has had knowledge of the '313 Patent at least since April 18, 2019. On that date, Apple was served with a copy of Red Rock's complaint in Eastern District of Texas Civil Action No. 2:19-cv-00117-JRG ("*Apple I*"). A copy of the '313 Patent was attached thereto.

23. *Apple I* was dismissed on February 8, 2020. *Apple I* at Dkt. 76. This dismissal was the result of a settlement, and the dismissal was jointly requested by the parties. *See id.* at Dkt. 75.

24. In the *Apple I* lawsuit, Red Rock accused of infringement Apple devices that used IEEE 802.11n and/or 802.11ac wireless transceivers designed and made by Broadcom Inc. (the "*Apple I* Accused Products"). The infringement claims asserted by Red Rock in *Apple I* were based on functionality in those Broadcom 802.11 chips, and no Qualcomm chips were implicated in *Apple I*. No devices with 5G wireless transceivers were accused of infringement in *Apple I*. The Apple Infringing Products that are accused of infringement in this lawsuit (e.g. iPhone 12, iPhone 12 mini, iPhone 12 Pro, and iPhone 12 Pro Max) were not accused of infringement in *Apple I*.

25. The Apple Infringing Products accused in this lawsuit did not exist on or before February of 2020. The Apple Infringing Products were first publicly announced on or about October 23, 2020. Accordingly, Red Rock could not have brought infringement claims against the Apple Infringing Products in the *Apple I* lawsuit.

26. The *Apple I* settlement agreement did not grant Apple a license or any other rights in the '313 Patent with respect to the Apple Infringing Products accused in this lawsuit.

27. Although both sets of products infringe the '313 Patent, the Apple Infringing Products accused in this lawsuit are materially different from the *Apple I* Accused Products. These differences are related to the limitations of the asserted '313 Patent and these differences are relevant to the infringement inquiry. Examples of such differences include the following:

- a. The *Apple I* Accused Products were accused of infringement based on functionality found in IEEE 802.11n and/or 802.11ac transceivers designed and made by Broadcom Inc. The Apple Infringing Products in this case are accused of infringement based on functionality found in 5G wireless transceivers made by Qualcomm. These 5G wireless transceivers are not designed or made by Broadcom, nor are any Broadcom 802.11 transceivers implicated in this case.
- b. The Apple Infringing Products differ from the *Apple I* Accused Products with respect to the “transmit chain” limitations of the asserted claims. The Apple Infringing Products have a different number of transmit chains than the *Apple I* Accused Products. The Apple Infringing Products’ transmit chains are designed to operate at different frequencies than the *Apple I* Accused Products’ transmit chains. The transmit chains in the Apple Infringing Products use different baseband-to-RF conversion structures than the transmit chains in the *Apple I* Accused Products. The baseband I-Q amplification structures found in the transmit chains of the Apple Infringing Products differ from the baseband I-Q amplification structures found in the transmit chains of the *Apple I* Accused Products in one or more material ways, including position in the chain, gain, linearity, and/or frequency response.

- c. The Apple Infringing Products differ from the *Apple I* Accused Products with respect to the “receive chain” limitations of the asserted claims. The Apple Infringing Products have a different number of receive chains than the *Apple I* Accused Products. The Apple Infringing Products’ receive chains are designed to operate at different frequencies than the *Apple I* Accused Products’ receive chains. The receive chains in the Apple Infringing Products use different RF-to-baseband conversion structures than the receive chains in the *Apple I* Accused Products. The baseband I-Q amplification structures found in the receive chains of the Apple Infringing Products differ from the baseband I-Q amplification structures found in the receive chains of the *Apple I* Accused Products in one or more material ways, including position in the chain, gain, linearity, and/or frequency response.
- d. The Apple Infringing Products differ from the *Apple I* Accused Products with respect to the “processor” limitations of the asserted claims. Specifically, the *Apple I* Accused Products’ processors differ from the Apple Infringing Products’ processors in one or more material ways, including number of cores, number of threads, power consumption, memory, and/or clock speed. The *Apple I* Accused Products’ processors execute different source code than the Apple Infringing Products’ processors.
- e. The infringement contentions Red Rock served in *Apple I* are attached as Exhibit C. Additional differences between the Apple Infringing Products and the *Apple I* Accused Products are apparent from a comparison of Exhibit B to this Amended Complaint and Exhibit C to this Amended Complaint. Those

documents cite completely different evidence for each asserted claim limitation.

The fact that Red Rock cited completely different evidence demonstrates that the Apple Infringing Products differ from the *Apple I* Accused Products with respect to each of the limitations of the asserted claims of the '313 Patent and these differences are relevant to the infringement inquiry.

28. Apple knew that its conduct amounted to infringement of the '313 Patent. As alleged above, Apple knew of the '313 Patent and possessed a copy of it. Apple also knew that the 5G wireless transceivers in the Apple Infringing Products infringe the systems and methods claimed by the '313 Patent because, on information and belief, Apple possessed documents, source code, know-how, and other sources of information describing how these 5G wireless transceivers operate and how they perform I-Q gain imbalance calibration. Furthermore, Apple knew of the minimum EVM and/or Rx sensitivity requirements specified by the 5G standard and Apple knew that there are no commercially acceptable non-infringing alternatives to the '313 Patent invention that would enable its Apple Infringing Products to meet those minimum EVM and/or Rx sensitivity requirements.

29. Apple knew that it did not have a license or any other rights in the '313 Patent with respect to the Apple Infringing Products accused in this lawsuit because Apple possessed a copy of the settlement agreement entered in connection with *Apple I*. Apple knew that the dismissal of the *Apple I* lawsuit did not operate as an adjudication of non-infringement with respect to the Apple Infringing Products because those products did not exist in February 2020 and because Apple knew the Apple Infringing Products differ from its *Apple I* Accused Products and that these differences are related to the limitations of the asserted '313 Patent.

30. On information and belief, Apple possessed documents, source code, know-how, and other sources of information describing how its Apple Infringing Products perform I-Q gain imbalance calibration. Apple also possessed documents, source code, know-how, and other sources of information describing how its *Apple I* Accused Products perform I-Q gain imbalance calibration. Apple therefore knew that its Apple Infringing Products differ from its *Apple I* Accused Products and that these differences are related to the limitations of the asserted '313 Patent.

31. Defendant Apple has knowledge of the '313 Patent and indirectly infringes at least claims 7, 8, 11, 12, 15, 16, 17, 18, 21, 22, 23, 26, 27, 30, 32, 33, 34, 37, 44, 45, 48, 49, 52, 53, 54, 55, 58, 59, 60, 63, 64, 67, 69, 70, 71, and 74 of the '313 Patent by active inducement under 35 U.S.C. § 271(b) and/or § 271(f). Defendant Apple has induced, caused, urged, encouraged, aided and abetted its direct and indirect customers to make, use, sell, offer for sale and/or import Infringing Products. Defendant Apple has done so by acts including but not limited to selling Infringing Products to its customers; marketing Infringing Products; and providing instructions, technical support, and other support and encouragement (available via <https://support.apple.com/>, for instance) for the use of Infringing Products. For example, Apple maintains a web page where it specifically instructs its customers how to infringe by enabling and using the 5G wireless transceivers in the Apple Infringing Products. See <https://support.apple.com/en-us/HT211828> ("Use 5G with your iPhone"). Such conduct by Defendant Apple was intended to and actually resulted in direct infringement, including the making, using, selling, offering for sale, and/or importation of Infringing Products in the United States.

32. The acts of infringement by Defendant Apple have caused damage to Red Rock, and Red Rock is entitled to recover from Defendant Apple the damages sustained by Red Rock as a result of Defendant Apple's wrongful acts in an amount subject to proof at trial. The infringement of Red

Rock's exclusive rights under the '313 Patent by Defendant Apple has damaged and will continue to damage Red Rock, causing irreparable harm, for which there is no adequate remedy at law, unless enjoined by this Court.

33. Apple's aforementioned actions have been, and continue to be, committed in a knowing, willful, and egregious manner and constitute willful infringement of the '313 Patent. As alleged above, Apple knew, or should have known, that its conduct amounted to infringement of the '313 Patent. Despite this knowledge, Apple continued to willfully and egregiously infringe the '313 Patent.

INFRINGEMENT OF U.S. PATENT NO. 7,346,313 BY QUALCOMM

34. On information and belief and pursuant to 35 U.S.C. § 271(a), Qualcomm has directly infringed and continues to directly infringe numerous claims of the '313 Patent, including at least claims 7, 8, 11, 12, 15, 16, 17, 18, 21, 22, 23, 26, 27, 30, 32, 33, 34, 37, 44, 45, 48, 49, 52, 53, 54, 55, 58, 59, 60, 63, 64, 67, 69, 70, 71, and 74 by its manufacture, use, sale, importation, and/or offer for sale of 5G wireless transceivers and Wi-Fi 6 wireless transceivers (the "Qualcomm Infringing Products" or the "Qualcomm Accused Products"). Based on Qualcomm's public statements and third party analyses of Qualcomm's products, the Qualcomm Infringing Products include, for example, 5G wireless transceivers that comply in whole or in part with 3GPP release 15 and/or later releases. The Qualcomm Infringing Products also include, for example, Wi-Fi 6 wireless transceivers that comply in whole or in part with IEEE 802.11ax and/or later versions of IEEE 802.11. These 5G and/or Wi-Fi 6 wireless transceivers include the Qualcomm products listed in Exhibit B. On the basis of information and belief, the 5G and Wi-Fi 6 wireless transceivers in the Qualcomm Infringing Products infringe the systems and methods claimed by the '313 Patent.

35. Red Rock hereby incorporates by reference Exhibit B to this Complaint. Exhibit B sets forth additional evidence and allegations supporting Red Rock's Patent Infringement Claims against Qualcomm.

36. Qualcomm has had knowledge of the '313 Patent since at least November 7, 2008 when Qualcomm received an International Search Report in connection with Qualcomm's prosecution of PCT/US2008/050152. That Notice cited U.S. App. No. 2003/0223480 to Cafarella, which had already issued as U.S. Pat. No. 7,346,313 on March 18, 2008.

37. Qualcomm had further knowledge of the '313 Patent since at least October 16, 2009 when Qualcomm received a Notice of References Cited by Examiner in connection with Qualcomm's prosecution of U.S. App. No. 11/341,184. That Notice cited U.S. App. No. 2003/0223480 to Cafarella, which had already issued as U.S. Pat. No. 7,346,313 on March 18, 2008.

38. Qualcomm had further knowledge of the '313 Patent as of at least March 16, 2011 when Qualcomm submitted an Information Disclosure Statement in connection with its prosecution of U.S. App. No. 11/968,644. That Statement cited U.S. App. No. 2003/0223480 to Cafarella, which had already issued as U.S. Pat. No. 7,346,313 on March 18, 2008.

39. Qualcomm had further knowledge of the '313 Patent as of at least August 1, 2017, when Red Rock served Qualcomm with a subpoena in connection with Eastern District of Texas Civil Action No. 2:17-cv-00101-RWS-RSP. That subpoena specifically referenced "U.S. Patent No. 7,346,313" and sought discovery about it.

40. Defendant Qualcomm has knowledge of the '313 Patent and indirectly infringes at least claims 7, 8, 11, 12, 15, 16, 17, 18, 21, 22, 23, 26, 27, 30, 32, 33, 34, 37, 44, 45, 48, 49, 52, 53, 54, 55, 58, 59, 60, 63, 64, 67, 69, 70, 71, and 74 of the '313 Patent by active inducement under 35 U.S.C. § 271(b) and/or § 271(f). Defendant Qualcomm has induced, caused, urged, encouraged,

aided and abetted its direct and indirect customers to make, use, sell, offer for sale and/or import Infringing Products. Defendant Qualcomm has done so by acts including but not limited to selling Infringing Products to its customers; marketing Infringing Products; and providing instructions, technical support, and other support and encouragement for the use of Infringing Products. Such conduct by Defendant Qualcomm was intended to and actually resulted in direct infringement, including the making, using, selling, offering for sale, and/or importation of Infringing Products in the United States.

41. The acts of infringement by Defendant Qualcomm have caused damage to Red Rock, and Red Rock is entitled to recover from Defendant Qualcomm the damages sustained by Red Rock as a result of Defendant Qualcomm's wrongful acts in an amount subject to proof at trial. The infringement of Red Rock's exclusive rights under the '313 Patent by Defendant Qualcomm has damaged and will continue to damage Red Rock, causing irreparable harm, for which there is no adequate remedy at law, unless enjoined by this Court.

42. Qualcomm's aforementioned actions have been, and continue to be, committed in a knowing willful, and egregious manner and constitute willful infringement of the '313 Patent.

PRAYER FOR RELIEF

WHEREFORE, Red Rock prays for the following relief:

43. A judgment in favor of Red Rock that Defendant Apple has infringed and is infringing, either literally and/or under the doctrine of equivalents, U.S. Patent No. 7,346,313;

44. A judgment in favor of Red Rock that Defendant Qualcomm has infringed and is infringing, either literally and/or under the doctrine of equivalents, U.S. Patent No. 7,346,313;

45. An Order permanently enjoining Defendant Apple, its respective officers, agents, employees, and those acting in privity with them, from further direct and/or indirect infringement of U.S. Patent No. 7,346,313;

46. An Order permanently enjoining Defendant Qualcomm, its respective officers, agents, employees, and those acting in privity with them, from further direct and/or indirect infringement of U.S. Patent No. 7,346,313;

47. An award of damages to Red Rock arising out of Defendant Apple's infringement of U.S. Patent No. 7,346,313, including supplemental damages for any continuing post-verdict infringement up until entry of the final judgment, with an accounting, as needed, and enhanced damages pursuant to 35 U.S.C. § 284, together with prejudgment and post-judgment interest, in an amount according to proof;

48. An award of damages to Red Rock arising out of Defendant Qualcomm's infringement of U.S. Patent No. 7,346,313, including supplemental damages for any continuing post-verdict infringement up until entry of the final judgment, with an accounting, as needed, and enhanced damages pursuant to 35 U.S.C. § 284, together with prejudgment and post-judgment interest, in an amount according to proof;

49. An award of an ongoing royalty for Defendant Apple's post-judgment infringement in an amount according to proof in the event that a permanent injunction preventing future acts of infringement is not granted;

50. An award of an ongoing royalty for Defendant Qualcomm's post-judgment infringement in an amount according to proof in the event that a permanent injunction preventing future acts of infringement is not granted;

51. A declaration that Defendant Apple's infringement was willful and an award of treble damages pursuant to 35 U.S.C. § 284;

52. A declaration that Defendant Qualcomm's infringement was willful and an award of treble damages pursuant to 35 U.S.C. § 284;

53. An award of attorneys' fees pursuant to 35 U.S.C. § 285 or as otherwise permitted by law;
and

54. Granting Red Rock its costs and further relief as the Court may deem just and proper.

DEMAND FOR JURY TRIAL

55. Red Rock demands a trial by jury of any and all issues triable of right before a jury.

DATED: June 30, 2021

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that all counsel of record are being served with a copy of the foregoing document via the Court's CM/ECF system per Local Civil Rule CV-5(b)(2) on June 30, 2021.

/s/ Leslie V. Payne
Leslie V. Payne

Exhibit A



US007346313B2

(12) **United States Patent**
Cafarella

(10) **Patent No.:** **US 7,346,313 B2**
(45) **Date of Patent:** **Mar. 18, 2008**

(54) **CALIBRATION OF I-Q BALANCE IN TRANSCEIVERS**

(76) Inventor: **John H. Cafarella**, 65 Galloupes Point, Swampscott, MA (US) 01907

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 673 days.

(21) Appl. No.: **10/379,352**

(22) Filed: **Mar. 4, 2003**

(65) **Prior Publication Data**

US 2003/0223480 A1 Dec. 4, 2003

(51) **Int. Cl.**
H04B 17/00 (2006.01)

(52) **U.S. Cl.** **455/67.11; 455/67.13; 455/69; 455/70; 375/219; 375/222; 375/259**

(58) **Field of Classification Search** **455/67.11, 455/67.13, 69, 70, 78, 83; 375/219, 222, 375/259, 377**

See application file for complete search history.

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Primary Examiner—Matthew Anderson

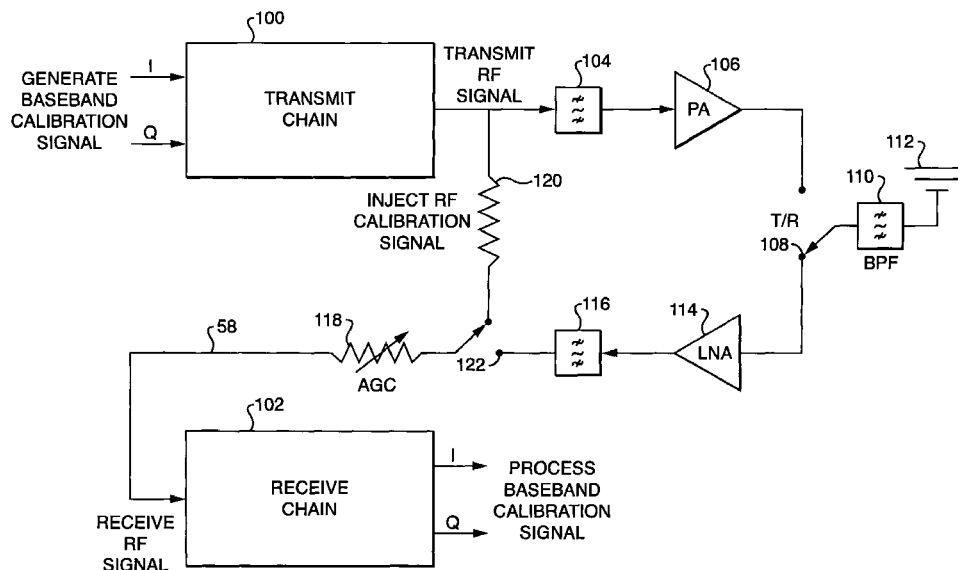
Assistant Examiner—Tuan Pham

(74) *Attorney, Agent, or Firm*—McDermott Will & Emery LLP

(57) **ABSTRACT**

Transceivers using direct conversion between baseband and RF have become popular for low-cost designs. Bandwidth-efficient modulations employ information on both phases of the carrier, and for high-order signaling alphabets, it becomes problematic to realize Direct-Conversion transceivers for which adequate gain balance between I and Q channels throughout the transmit and receive chains. For heterodyne transceivers I-Q balance is often less of an issue, by contrast, because most of the required gain operates at an Intermediate Frequency. In both cases, the trend toward lower supply voltages further exacerbates this problem because of the poorer control of analog parameters at low voltage. The present invention addresses this difficulty via a calibration method and system in which a calibration signal is generated in the transmit stage and injected into the receive stage so that any mismatches in gain can be observed and corrected.

74 Claims, 11 Drawing Sheets



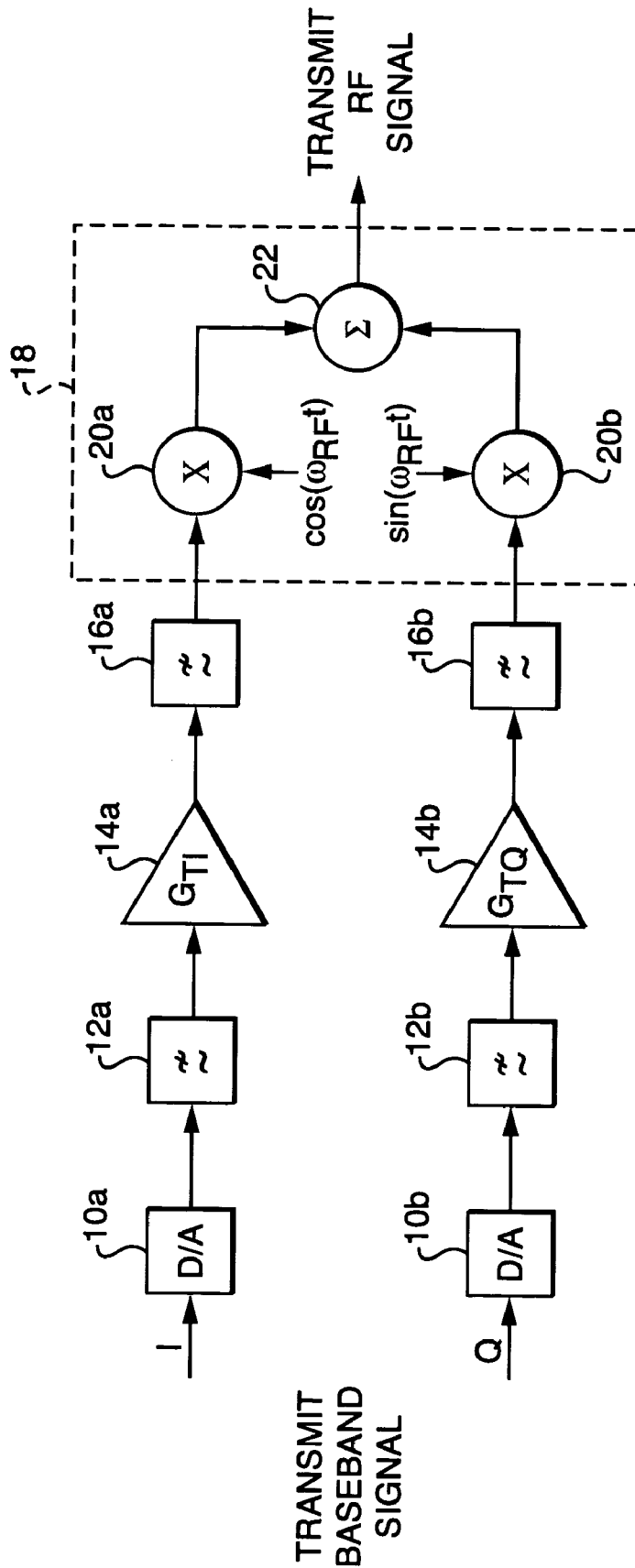


FIG. 1A
(PRIOR ART)

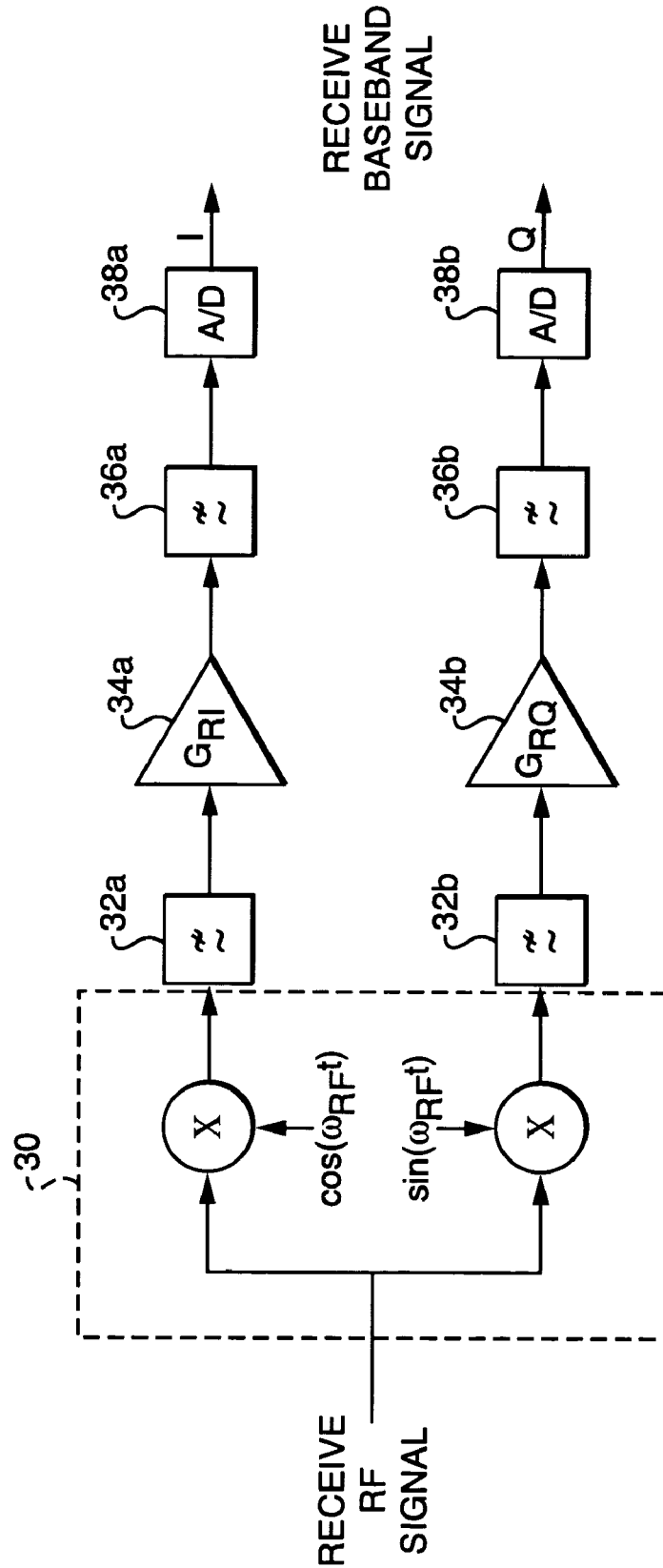


FIG. 1B
(PRIOR ART)

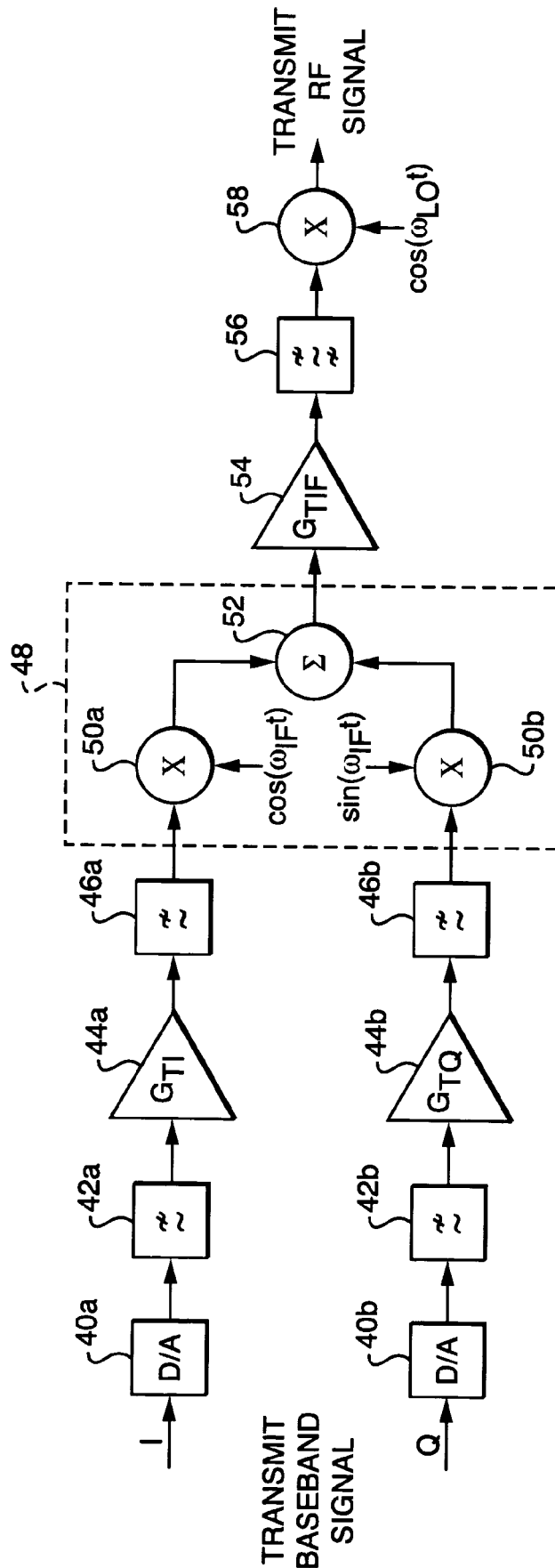


FIG. 2A
(PRIOR ART)

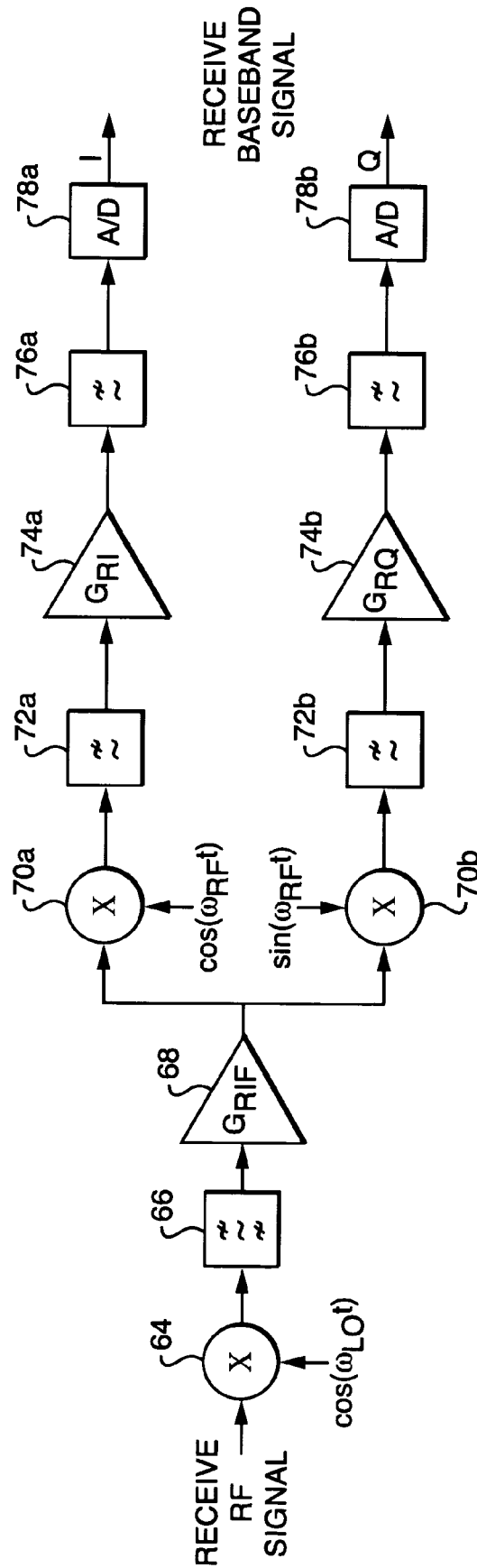


FIG. 2B
(PRIOR ART)

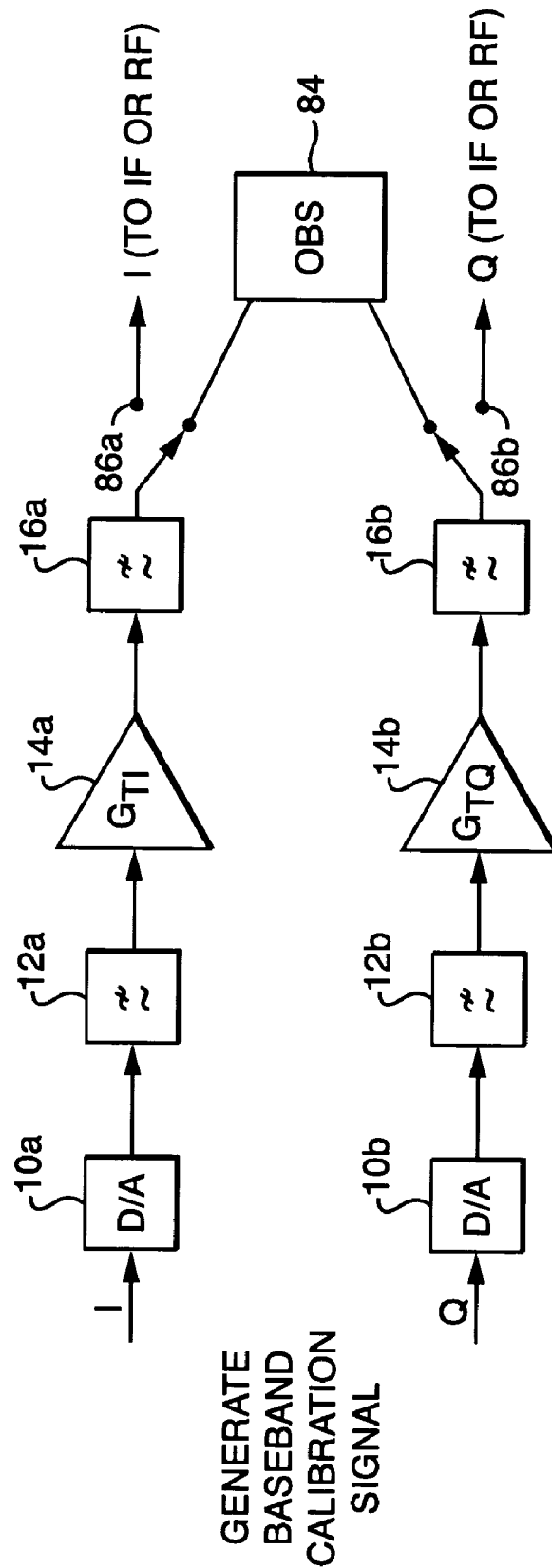


FIG. 3A
(PRIOR ART)

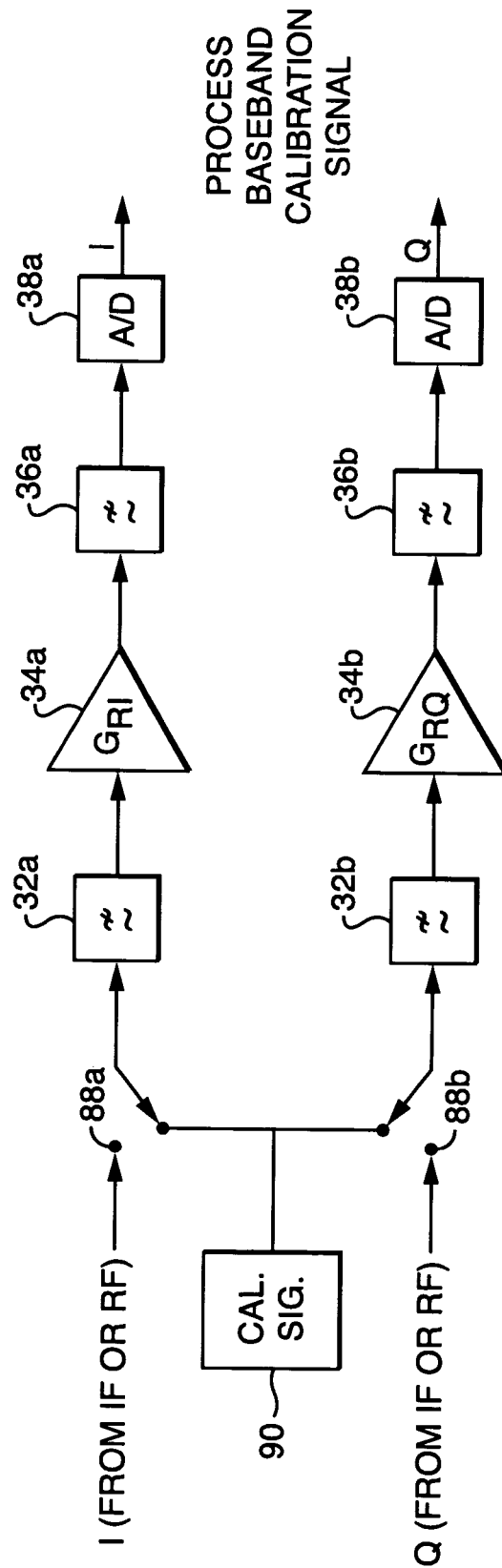


FIG. 3B
(PRIOR ART)

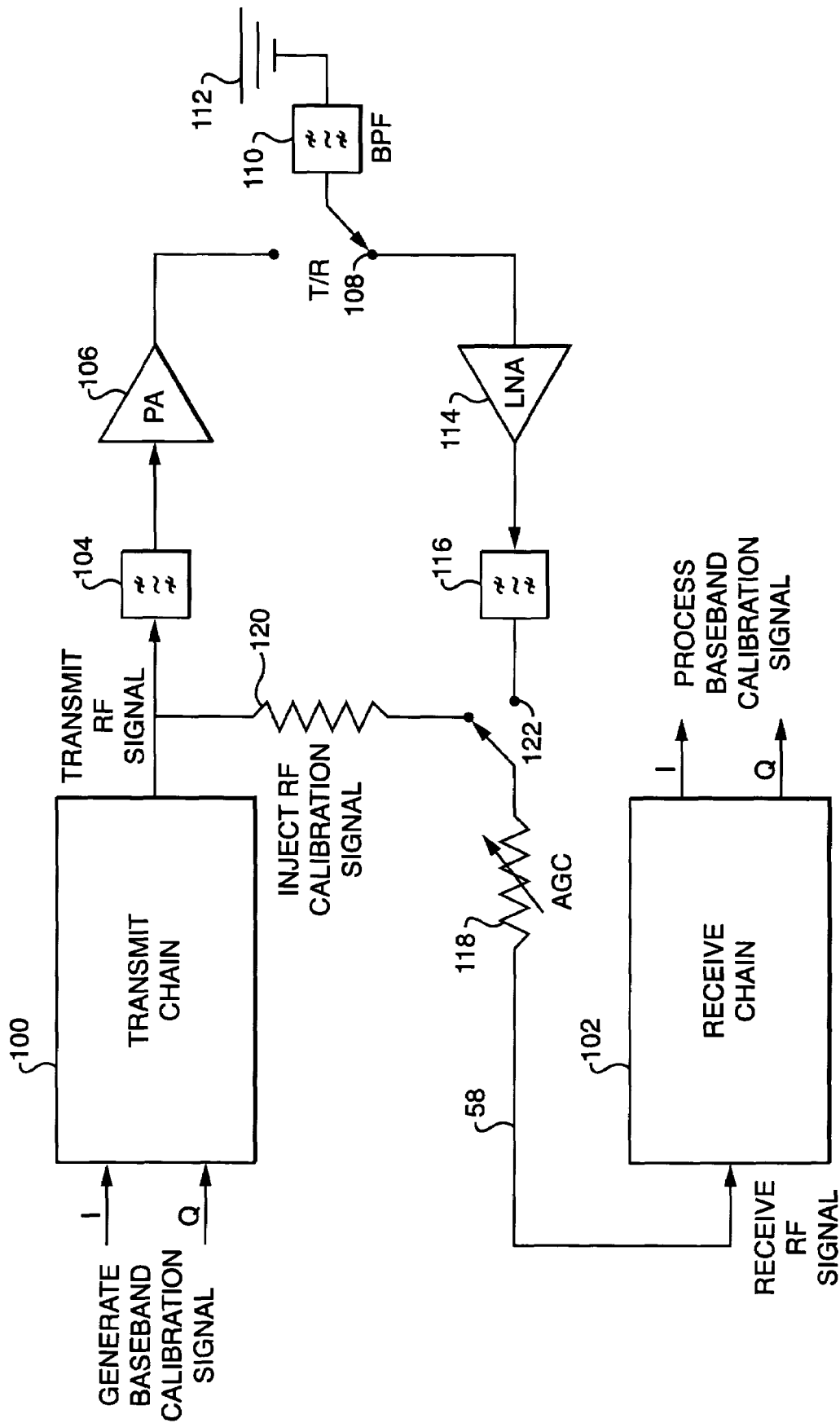


FIG. 4

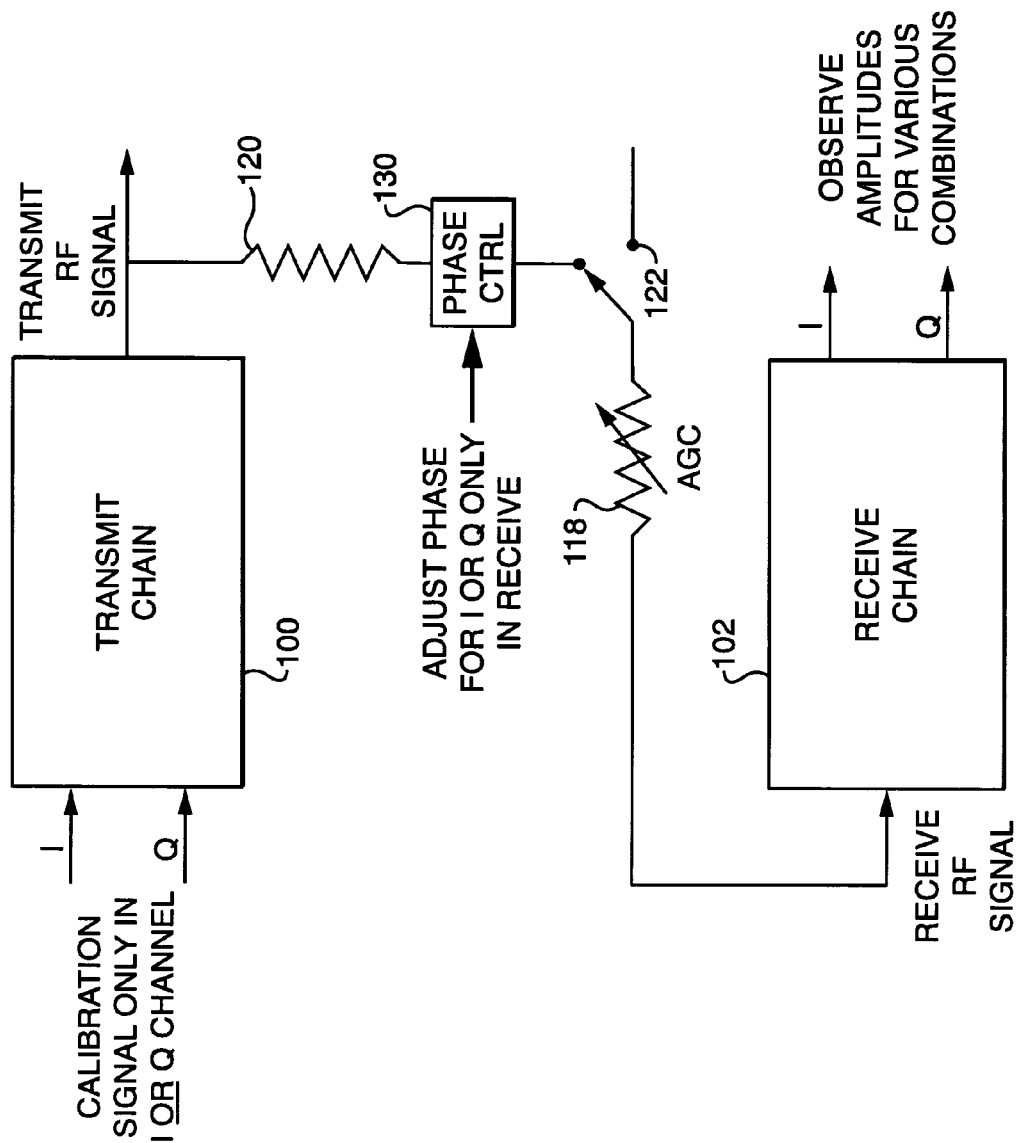


FIG. 5

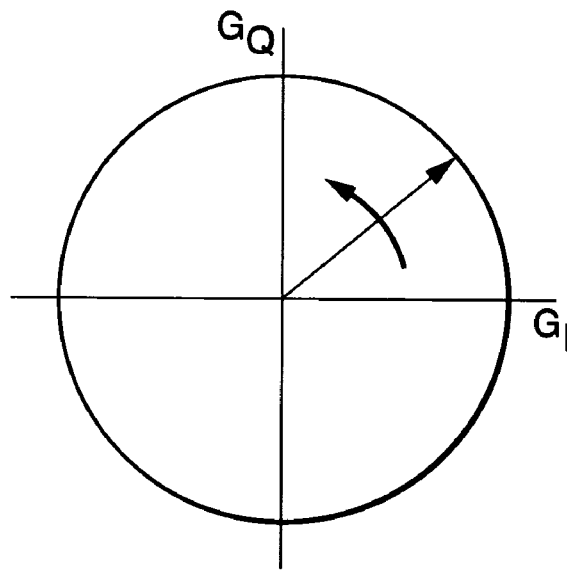


FIG. 6A

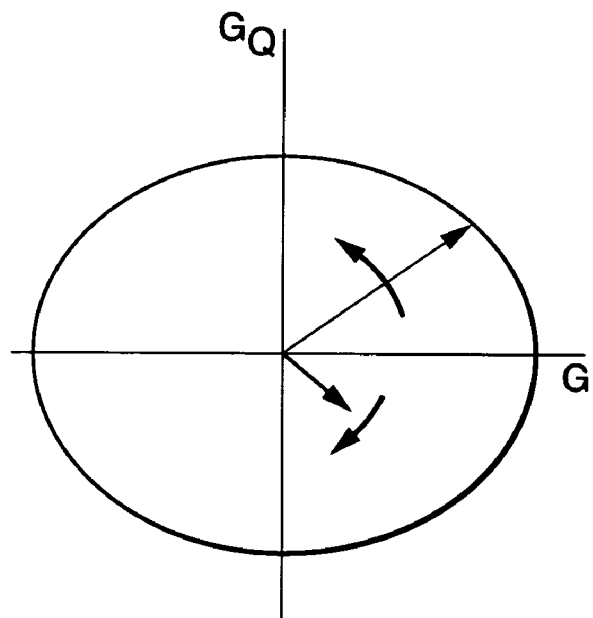


FIG. 6B

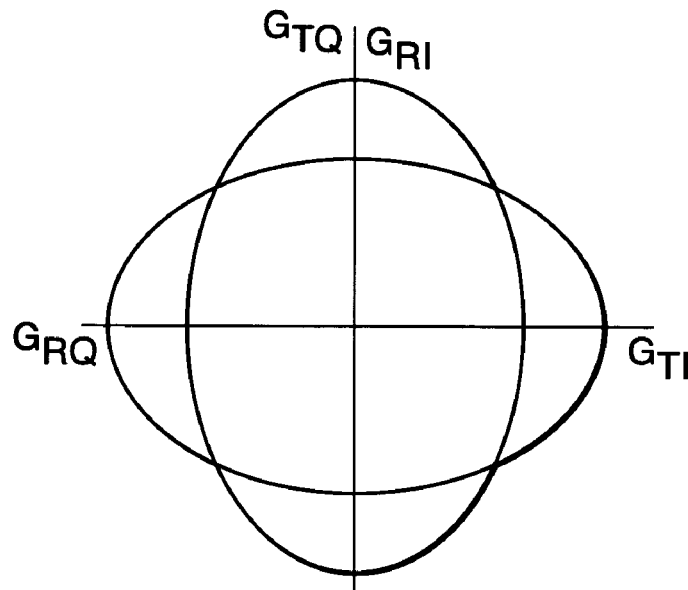


FIG. 7A

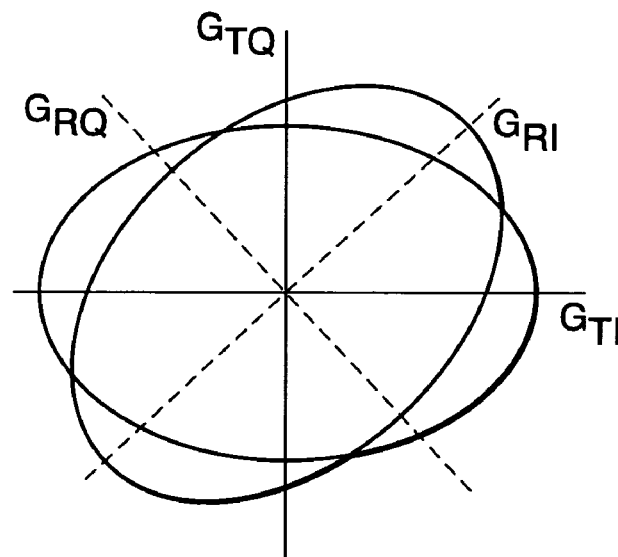


FIG. 7B

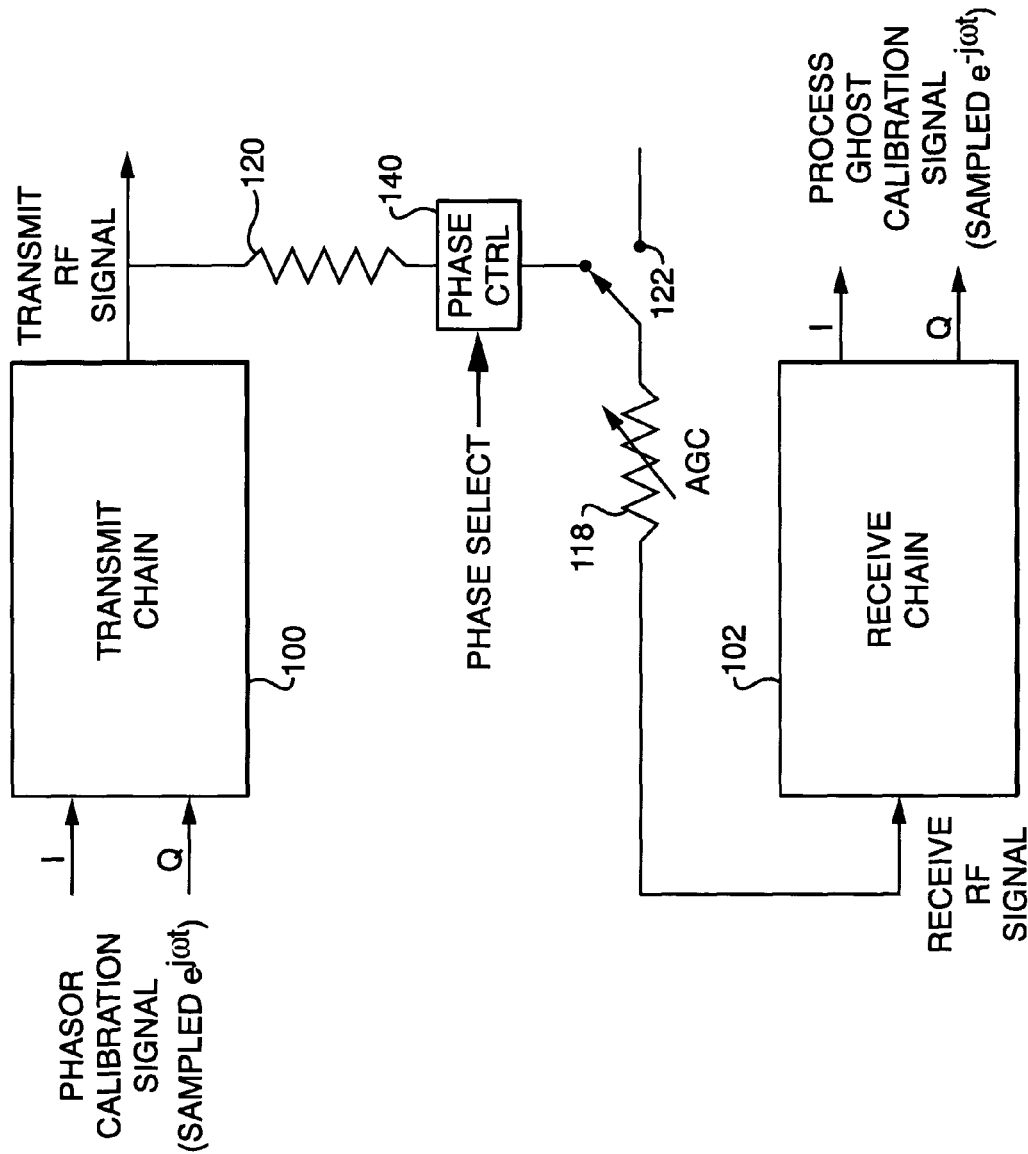


FIG. 8

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**CALIBRATION OF I-Q BALANCE IN
TRANSCIVERS****FIELD OF THE INVENTION**

This invention relates generally to transceivers for digital communications whose modulations require gain balance between I and Q channels, and more particularly for low-cost applications of such transceivers, such as wireless LANs.

BACKGROUND OF THE INVENTION

Wireless communication systems can employ different types of transceivers. Traditional heterodyne transceivers, for example, employ most of the required gain at an Intermediate-Frequency (IF), between the Radio Frequency (RF) and baseband. While very attractive for high-performance applications, heterodyne transceivers require IF components, which cannot be integrated on-chip, thereby increasing the cost. Direct-conversion transceivers, as the name implies, convert directly between RF and baseband, and hence have become popular for Integrated Circuits (ICs) to be used in low-cost equipment.

It is well known in the art that the bandwidth of wireless transmissions can be increased by transmitting data as complex components, e.g., general electronic signals can be represented as complex quantities mathematically, and that this can be viewed as using both phases of a carrier signal. Thus, it is generally accepted that a signal can have a real component synonymous with the real signal impressed upon the cosine carrier and identical to the in-phase (I) signal, and an imaginary component synonymous with the real signal impressed upon the sine carrier and identical to the quadrature (Q) signal. When not on a carrier, which is referred to as baseband, these I and Q signals exist as real signals in two channels commonly called I and Q, respectively. Because direct-conversion transceivers must realize most of the gain required for transmission and for reception at baseband, it becomes problematic to realize direct-conversion transceivers with adequate gain balance between the I and Q channels for some applications. Even heterodyne-conversion transceivers can be difficult in such situations; their baseband elements may not achieve adequate I-Q gain balance, especially at low supply voltages.

Bandwidth-efficient digital modulations, e.g., M-QAM and M-PSK, employ information on both in-phase and quadrature components of the carrier. As the number of constellation points M becomes large, the constellation points become close together; distortions of the complex amplitude eventually become the limiting factor in reducing symbol errors. The trend toward lower supply voltages further exacerbates this problem. While the performance of digital ICs eventually suffer at supply voltages below approximately 1V, poorer control of circuit parameters makes the performance of analog ICs difficult with power supplies below about 2.5V. Thus, calibration in order to balance the gains provided in the I and Q channels for both transmit and receive becomes critical for ICs designed to operate on low-voltage supplies.

While injection of DC calibration signals to calibrate the baseband transmit and receive gains is possible, the inclusion of this function presents a layout difficulty for critical circuitry. Furthermore, such signals would not provide calibration of the effective conversion gains of the RF up-conversion and down-conversion mixer elements.

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The present invention is designed to improve the quality of transceivers operating with low voltage power supplies so as to support higher signaling alphabets. The calibration technique must be comprehensive in the sense of calibrating the transmit and receive chains independently and also including all relevant gains in the calibration process. Finally, the calibration process should place less design stress on the circuitry than would be required using commonly known alternate calibration approaches such as the ones described below.

SUMMARY OF THE INVENTION

A system and method is described for calibrating a transceiver system for transmitting and receiving data using both I and Q channels and including a transmit chain and a receive chain. A calibration RF signal, generated in response to and as a function of a signal generated through the transmit chain, is injected into the receive chain of the transceiver in order to independently calibrate the I-Q gain balance of the both transmit and receive chains in their entirety.

In accordance with one embodiment, the calibration RF signal originates at baseband in the transmit channel, and is observed at baseband in the receive channel.

The transceiver can be a direct-conversion transceiver, or a heterodyne-conversion transceiver.

The channel gain can be adjusted so as to vary the differential I-Q gain in the transmit and receive chains independently in response to the calibration RF signal being injected into the receiver chain. The channel gain is adjusted so as to vary the differential I-Q gain in the imbalanced chain in response to the calibration RF signal being injected into the receiver chain.

In one embodiment a system and method calibrates a transceiver system for transmitting and receiving data using both I and Q channels, wherein the transceiver comprises (a) a transmit chain including a signal generator for generating a baseband transmit signal; baseband I-Q amplification subsystem for providing baseband amplification of the baseband transmit signal; a direct-conversion subsystem for converting the baseband transmit signal to an RF transmit signal, and including an RF transmit signal port; and (b) a receive chain including an RF receive port for receiving an RF receive signal; direct-conversion subsystem for converting the RF receive signal to a baseband receive signal; baseband I-Q amplification subsystem for providing amplification of the baseband receive signal; a processor for processing of the baseband receive signal as required for the normal function of the transceiver. The system and method includes using a calibration RF signal, generated as a baseband transmit signal; injecting the calibration RF signal from the RF transmit signal port to the RF receive signal port; processing the baseband receive calibration RF signal to form an observable indicator of I-Q imbalance; and varying the differential I-Q gain in the transmit and receive chains independently.

In one embodiment the injection of the calibration RF signal is prevented from permanently imparting an unfavorable net phase shift from baseband transmit to baseband receive. In one embodiment phase-calibration cycling is used to prevent the injection of the calibration RF signal from permanently imparting an unfavorable net phase shift from baseband transmit to baseband receive, while in another embodiment slowly time-varying phase modulation is used for that purpose.

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In one embodiment the calibration RF signal includes generating a sequence of pulses taking on purely real or imaginary values at any instant, a sampled phasor, or a discrete phasor, the latter, for example, comprising j^n or j^{-n} .

In one embodiment, the calibration RF signal includes a calibration cycle, and further includes using the calibration cycle so as to determine the transmitter I-Q gain settings so as to minimize the observable indicator while holding the receive I-Q gain settings constant, and determining the receiver I-Q gain settings so as to minimize the observable indicator while holding the transmit I-Q gain settings constant.

In one embodiment the calibration RF signal includes successive calibration cycles, and further including using the successive calibration cycles to refine or maintain I-Q balance.

In one embodiment, the system and method includes varying the differential I-Q gain in the imbalanced chain so as to adjust the gain.

Generating the calibration RF signal includes generating a sequence of pulses taking on purely real or imaginary values at any instant. The calibration RF signal includes a sampled phasor, or a discrete phasor. The discrete phasor can comprise j^n or j^{-n} . Successive calibration cycles can be used to refine or maintain I-Q balance.

In one embodiment a system and method is used to calibrate a transceiver system of the type comprising (a) a transmit chain including a signal generator for generating a baseband transmit signal; a baseband I-Q amplification subsystem for providing baseband amplification of the baseband transmit signal; at least one stage of frequency conversion of the baseband transmit signal to an intermediate frequency; a conversion subsystem for converting the baseband transmit signal at the intermediate frequency to an RF transmit signal, and an RF transmit signal port; and (b) a receive chain including an RF receiving port for receiving an RF receive signal; at least one stage of frequency conversion of the receive signal to an intermediate frequency; a conversion subsystem for converting the RF receive signal to a baseband receive signal; baseband I-Q amplification subsystem for providing amplification of the baseband receive signal; a processor for processing the baseband receive signal as required for the normal function of the transceiver. The calibration system and method comprises generating a calibration RF signal as a baseband transmit signal; injecting the calibration RF signal from the RF transmit signal port to the RF receive signal port; processing the baseband receive calibration RF signal to form an observable indicator of I-Q imbalance; and varying the differential I-Q gain in the transmit and receive chains independently so as to adjust the differential I-Q gain so as to minimize any difference.

In one embodiment the calibration RF signal is performed in such a way so as to prevent the calibration RF signal from permanently imparting an unfavorable net phase shift from baseband transmit to baseband receive. This is accomplished, for example, by a phase-calibration cycling, or a slowly time-varying phase modulation.

The calibration RF signal includes, in various embodiments, a sequence of pulses taking on purely real or imaginary values at any instant, a sampled phasor, or a discrete phasor. Regarding the latter, a discrete phasor can comprise j^n or j^{-n} .

In one embodiment the calibration RF signal includes a calibration cycle, wherein the method further includes using the calibration cycle to determine the transmitter I-Q gain settings which minimize the observable indicator while holding the receive I-Q gain settings constant, and deter-

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mining the receiver I-Q gain settings which minimizes the observable indicator while holding the transmit I-Q gain settings constant.

In another embodiment the calibration RF signal includes successive calibration cycles, and the system and method further include using successive calibration cycles to refine or maintain I-Q balance.

In one embodiment, at least one stage of frequency conversion includes amplification means for amplifying the transmit signal at the intermediate frequency.

In one embodiment, a system and method is used to calibrate a transceiver system of the type comprising: (a) a transmit chain including: a signal generator for generating a baseband transmit signal; a baseband I-Q amplification subsystem for providing baseband amplification of the baseband transmit signal; at least one stage of frequency conversion of the baseband transmit signal to an intermediate frequency; a conversion subsystem for converting the baseband transmit signal at the intermediate frequency to an RF transmit signal, and an RF transmit signal port; and (b) a receive chain including an RF receiving port for receiving an RF receive signal; at least one stage of frequency conversion of the receive signal to an intermediate frequency; a conversion subsystem for converting the RF receive signal to a baseband receive signal; baseband I-Q amplification subsystem for providing amplification of the baseband receive signal; and a processor for processing of the baseband receive signal as required for the normal function of the transceiver. The system and method comprise: generating a calibration RF signal as a baseband transmit signal; injecting the calibration RF signal from the RF transmit signal port to the RF receive signal port; processing the baseband receive calibration RF signal to form an observable indicator of I-Q imbalance; and varying the differential I-Q gain in the imbalanced chain so as to balance the I-Q gain.

The calibration RF signal includes, in various embodiments, a sequence of pulses taking on purely real or imaginary values at any instant, a sampled phasor, or a discrete phasor. The discrete phasor can comprise j^n or j^{-n} .

The system or method can use successive calibration cycles to refine or maintain I-Q balance.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, similar parts are shown with the same numerals for ease of exposition only.

FIGS. 1a and 1b show a typical prior art direct-conversion transceiver block diagram. FIG. 1a depicts the transmit chain. FIG. 1b depicts the receive chain.

FIGS. 2a and 2b show a typical prior art heterodyne-conversion transceiver block diagram. FIG. 2a depicts the transmit chain. FIG. 2b depicts the receive chain.

FIGS. 3a and 3b show a conventional prior art approach to calibration of the baseband gains in the transmit and receive chains which could be used for the baseband section of either direct-conversion or heterodyne-conversion transceivers. FIG. 3a depicts the transmit chain. FIG. 3b depicts the receive chain.

FIG. 4 shows one preferred embodiment of a typical transceiver incorporating the present invention and comprising transmit and receive chains plus a transmit power amplifier, receive low-noise amplifier, transmit/receive switch, band-pass filter, an antenna and an automatic gain control.

FIG. 5 shows a block diagram of one preferred embodiment of an approach utilizing purely real or imaginary

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calibration pulses, and forcing the observation to also be purely real or imaginary using a phase shift.

FIGS. 6a and 6b present graphical representations of phasor ghost generation due to gain imbalance. FIG. 6a shows a system with I-Q gain balance, such that a phasor experiences the same amplification independent of its instantaneous phase, while FIG. 6b shows a system with gain imbalance between the I and Q channels.

FIG. 7a shows the overlay of transmit and receive gain ellipses in the degenerate case of 90° net phase rotation, while FIG. 7b shows the non-degenerate case when the principle axes are not aligned.

FIG. 8 depicts a preferred embodiment of the preferred embodiment of a system having calibration based upon a phasor calibration signal with phase selection to avoid degenerate alignment of the gain ellipses for transmit and receive.

DETAILED DESCRIPTION OF THE DRAWINGS

The present invention is directed to a system for and method of injecting the transmit signal into the receive chain of the transceiver in order to support calibration independently of the I-Q gain balance of the both transmit and receive chains in their entirety, as required for proper operation among multiple users. This provides comprehensive I-Q gain balance, and in addition can be effected with non-critical circuit layout for the injection signal path. Furthermore, the calibration signals can originate at baseband in the transmit channel, and be observed at baseband in the receive channel. Consequently, there is minimal impact on the circuit layout to implement this calibration technique. While motivated primarily to enable realization of direct-conversion transceivers, this calibration method can be applied to heterodyne-conversion or alternative transceiver structures which implement less of the required gain at baseband.

More specifically, in order to attain high accuracy in the I-Q gain balance, a calibration signal is applied to the baseband input of the transmit chain. This signal is amplified and converted to a signal at the transmit RF port as would be any transmit signal during normal operation. Thus, this transmit RF signal includes all gains relevant to normal operation in the transmit chain.

A signal injection path is made available from the transmit RF output to the receive RF input of the transceiver. This injection path would be substantially suppressed in normal transceiver operation so as not to degrade receiver noise figure. The amplitude and phase accuracy for the injection path are generally non-critical, and the overall calibration process should be designed to not require excessive design stress on the injection path.

This receiver RF signal is amplified and converted to a signal at the receive baseband port as would be any receive signal during normal operation. Thus, this receive baseband signal includes all gains relevant to normal operation in the receive chain.

The calibration signal must be designed to be sensitive to I-Q gain imbalance. Furthermore, reasonably simple processing should be capable of producing an observable indicator of that imbalance. The calibration signal and subsequent processing must be such that the observable indicator of gain imbalance can only be minimized when both the transmit and receive gain imbalances have been individually minimized. That is, it should not be possible for a transmit-chain I-Q imbalance to be masked by any possible receive-chain I-Q gain imbalance.

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The overall calibration process preferably proceeds by minimizing the imbalance observable with respect to gain adjustments in the transmit chain while holding the gains in the receive chain fixed, then minimizing the imbalance observable with respect to gain adjustments in the receive chain while holding the gains in the transmit chain fixed. Of course, whether the transmit or receive chain is adjusted first is immaterial. Furthermore, the process could alternate several times if required, for example, after initial application of power to the transceiver. In addition, after stable operation is achieved some form of prediction or adaptation algorithm could be used to minimize the frequency of calibration cycles required.

In some applications the need for recurrent calibration cycles might be objectionable. However, commonly a transceiver operates in half-duplex, and often with substantial structure in the pattern of transmissions and receptions. For example, there is usually a guard time interval, for example the inter-frame space in wireless LANs, during which a transceiver just having finished a transmission could perform a calibration cycle with no impact on system operation.

Referring specifically to the drawing Figures:

FIG. 1 shows a typical direct-conversion transceiver block diagram. FIG. 1a depicts the transmit chain. The baseband I and Q digital signals are converted by digital-to-analog (A/D) converters 10a and 10b, respectively, to analog signals, and passed through low-pass anti-aliasing filters 12a and 12b to form the analog version of the baseband transmit waveform. The resulting signals are amplified by the in-phase and quadrature transmit gains G_{TI} and G_{TQ} amplifiers 14a and 14b, low-pass filtered again by low pass filters 16a and 16b to limit the noise bandwidth, then converted to the complex RF signal in a complex modulator 18, as shown here using cosine and sine mixers 20a and 20b and summation at 22.

FIG. 1b depicts the receive chain. The RF signal is converted using demodulator 30 to baseband by mixing with cosine and sine signals at the RF frequency, and the I and Q components subsequently passed through low-pass filters 32a and 32b to suppress undesired frequencies. The resulting signals are amplified by the in-phase and quadrature receive gains G_{RI} and G_{RQ} of amplifiers 34a and 34b then passed through low-pass filters 36a and 36b which limit the noise bandwidth before sampling in the analog-to-digital (A/D) converters 38a and 38b.

It is well known in the art that a variety of such direct modulator and demodulator design implementations can be used, including conventional designs as shown in FIG. 1 as well as those which utilize sub-harmonic mixers. For example, a popular approach is to utilize a mixer driven by a local oscillator signal at half the RF carrier frequency to minimize the effects of local oscillator signal coupling to various circuit elements. The calibration technique described in this patent is applicable to any form of conversion between RF and baseband, and not limited to the conventional approach used as examples in the figures.

FIG. 2 shows a typical heterodyne-conversion transceiver block diagram. FIG. 2a depicts the transmit chain. The baseband I and Q signals are converted from digital to analog using D/A converters 40a and 40b, and passed through low-pass anti-aliasing filters 42a and 42b to form the analog version of the baseband transmit waveform. The resulting signals are amplified by the in-phase and quadrature transmit gains G_{TI} and G_{TQ} of amplifiers 44a and 44b, low-pass filtered again by low pass filters 46a and 46b to limit the noise bandwidth, then converted to the complex IF signal in a complex modulator 48, as shown here using

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cosine and sine mixers **50a** and **50b** and summation **52**. The IF signal is amplified by the transmit IF gain G_{TIF} of amplifier **54**, filtered in the transmit IF filter **56**, then mixed with the local oscillator **58** to translate to an RF signal.

FIG. **2b** depicts the receive chain. The RF signal is converted to an IF signal by mixing with the local oscillator **64**, passed through the IF band pass filter **66**, and amplified by the receive IF gain G_{RIF} amplifier **68**. The receive IF signal is converted to baseband by mixing with cosine and sine signals at the IF frequency using mixers **70a** and **70b** of the I and Q channels, and passed through low-pass filters **72a** and **72b** to suppress undesired frequencies. The resulting signals are amplified by the in-phase and quadrature receive gains G_{RI} and G_{RQ} of amplifiers **74a** and **74b**, then passed through low-pass filters **76a** and **76b** which limit the noise bandwidth before sampling in the analog-to-digital converters **78a** and **78b**. The transmit and receive IF gains G_{TIF} and G_{RIF} of amplifiers **68**, **70a** and **70b** reduce the amount of gain required at baseband in the heterodyne-conversion transceiver, reducing the stress on baseband I-Q gain balance. However, the method of this patent can be used for heterodyne-conversion transceivers if a high degree of baseband I-Q gain balance is needed.

Typical transceiver designs require less gain in the transmit chain than used in the receive chain. Nevertheless, when very high accuracy is required to demodulate a particular signaling constellation it becomes necessary to calibrate both the transmit and receive chains. FIGS. **3a** and **3b** show a conventional prior art approach to calibration of the baseband gains in the transmit and receive chains of a transceiver, the approach being one which can be used for the baseband section of either direct-conversion or heterodyne-conversion transceivers.

FIG. **3a** depicts the injection of a calibration signal into the normal I and Q inputs of the baseband transmit chain of the type shown in FIG. **1a**. Circuitry **84** for forming an observation of the I and Q signals after baseband amplification must be included. The switches **86a** and **86b** shown for diverting the signals to the observation circuitry may not be necessary, depending upon circuit details. In any case, the paths to the comparison inputs of the observation circuitry, as well as the response of the observation circuitry to the two inputs, must match to ensure that the observation circuitry can adequately indicate a lack of I-Q gain imbalance in the baseband transmit chain.

FIG. **3b** depicts the injection of a calibration signal into the I and Q inputs of the baseband receive chain of the type shown in FIG. **1b**. The switches **88a** and **88b** shown for inserting the calibration signals may not be necessary, depending upon circuit details, but some means must be used to ensure that the calibration signal does not degrade reception during normal operation, and that received signals do not contaminate the calibration signal during the calibration process. The normal I-Q outputs of the receive chain can be monitored for forming an observation of the I and Q signals after baseband amplification. The paths from the calibration signal source **90** to the gain-chain inputs must match to ensure that the same calibration signal is delivered to both I and Q receive gain chains.

The extra circuitry required in FIGS. **3a** and **3b** is not extensive, but this circuitry must be included in portions of the overall design in places which are typically sensitive to layout constraints. Furthermore, the individual calibration of baseband gains in the transmit and receive chains does not include the conversion gains of the up-conversion and down-conversion mixing elements. Since these conversion gains may not match in the I and Q channels, a compre-

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hensive calibration technique is needed. The present invention overcomes all of these difficulties. This method applies to a direct-conversion transceiver, but could be applied to calibrate I-Q gain balance in the baseband portion of a conventional heterodyne transceiver as well, or any other transceiver requiring I and Q channel gain balance. In addition, even if the transmit I-Q gain balance is achievable without calibration, the method of this invention can be used to calibrate the I-Q gain balance in the receive chain alone.

FIG. **4** shows a typical transceiver comprising the transmit and receive chains of FIG. **1** or FIG. **2**, for example, and numbered **100** and **102** respectively. The calibration circuitry preferably includes a bandpass filter **104**, transmit power amplifier (PA) **106**, a transmit/receive (T/R) switch **108**, a band-pass filter **110**, an antenna **112**, a receive low-noise amplifier (LNA) **114**, a bandpass filter **116** and an automatic gain control (AGC) **118**. These are all well-known elements of transceiver RF design. Operation of the AGC at RF is not essential, but it is a preferred approach because it enables fixed baseband amplification, which is more amenable to calibration. The RF signal from the transmit chain is provided a path to the RF receive chain, shown for example through an attenuator **120**. This injection can be effected in many ways. It could be a dedicated signal path which is disabled in normal transceiver operation but activated for a calibration cycle. It could also be a controllable leakage path within the other RF circuitry. In any event, the amplitude and phase of the transmission path for the injected signal are not critical because the signal, being on the RF carrier at this point, is not subject to I-Q gain imbalance. Switch **122** is preferably a simple single throw, double pole switch used to switch between the calibration mode (as shown) to an operation mode (the switch being thrown in opposite position).

The calibration concept shown in FIG. **4** employs the normal baseband transmit input for introducing the calibration signal, and the normal baseband receive output for forming the observable indicative of I-Q gain imbalance. The only additional circuitry required for calibration is that to provide injection of the calibration signal from RF transmit output to RF receive input. This injection path is not critical in its transfer characteristics, nor is it located in critical layout areas for normal operation. Furthermore, this approach includes in the overall path of the calibration signal all paths used during normal operation, and therefore all possible sources of I-Q gain imbalance in the transmit and receive chains.

A variety of calibration signals could be found useful. These should be easy to generate and process, and the effect of I-Q gain imbalance must be directly related to an observable feature. One example is a sequence of pulses, in any order, for which a pulse is either purely real or purely imaginary at the transmit baseband input.

FIG. **5** shows a block diagram describing this approach. This corresponds to applying a non-zero value to the I or Q input of the transmit chain **100** while making the alternate, Q or I input, respectively, zero. In this case the signal path providing injection of the calibration signal from transmit RF to receive RF must include a phase control **130** for shifting RF carrier phase so that the signal can be made to substantially appear at only the I or Q output of the receive baseband. The transmit I and Q gains are G_{TI} and G_{TQ} , respectively, while the receive I and Q gains are G_{RI} and G_{RQ} , respectively. By suitable observation of the receive baseband output signal for the various transmit baseband input signals, while also adjusting the phase of the injected signal from transmit RF to receive RF, it is possible to

determine the four combinations $G_{TT}G_{RI}$, $G_{TT}G_{RQ}$, $G_{TQ}G_{RI}$ and $G_{TQ}G_{RQ}$. Therefore, it is possible to determine the transmit-chain I-Q gain imbalance by computing $|G_{TT}G_{RI}| - |G_{TT}G_{RQ}|$ and/or $|G_{TQ}G_{RI}| - |G_{TQ}G_{RQ}|$ without knowing either G_{RI} or G_{RQ} . Similar is true for determining the receive-chain I-Q imbalance.

While the above process would provide adequate calibration for many applications, the phase control in the calibration-signal injection path is somewhat difficult. It requires a total range of phase shift in excess of 90° , and precision in phase control consistent with the ultimate calibration accuracy required. It furthermore requires extra time during the calibration process to make the multiple phase adjustments accurately.

A preferred embodiment for the calibration signal is a baseband phasor at non-zero frequency. It is well known in the radar art that I-Q gain imbalance in a radar receiver causes "ghosts" in a Doppler response. That is, for a target signal having a temporal modulation $e^{j\omega t}$, where ω is the Doppler frequency imparted by the target motion, I-Q gain imbalance in the radar receiver causes a second signal $\gamma e^{-j\omega t}$, where $\gamma = (G_{RI} - G_{RQ}) / (G_{RI} + G_{RQ})$ is the gain imbalance parameter. Thus, a target moving away from the radar has a ghost moving toward the radar. In the present invention, a phasor calibration signal applied as the baseband transmit input signal will produce a ghost phasor rotating in the opposite direction if either the transmit or receive chain have gain imbalance between I and Q. This ghost phasor constitutes an observable for the calibration process.

FIG. 6 presents a graphical representation of this ghost generation due to gain imbalance. FIG. 6a shows a system with I-Q gain balance, such that a phasor experiences the same amplification independent of its instantaneous phase. FIG. 6b shows a system with gain imbalance between the I and Q channels. The gain is now an ellipse, rather than a circle. An input phasor rotating clockwise must be accompanied by another phasor rotating counterclockwise so that the two will add along the axis having higher gain and subtract along the axis with lower gain.

While the amplitude and phase characteristics for the calibration injection path are not critical, it is necessary to avoid phases which result in a net phase between the transmit and receive which is a multiple of 90° . This net phase includes the transmission phase of the injection path as well as differences in the LO phase.

FIG. 7a shows the overlay of transmit and receive gain ellipses in the degenerate case of 90° net phase rotation as the calibration signal goes from baseband in the transmit chain to baseband in the receive chain. When the principle axes of the two ellipses align, there can be a net gain balance in I and Q in going from transmit baseband to receive baseband, while at the same time the transmit and receive chains each can have substantial I-Q gain imbalance. Thus, with degenerate axis alignment the calibration could not produce a feature which ensures the ability to calibrate the transmit and receive chains independently.

FIG. 7b shows the non-degenerate case when the principle axes are not aligned. In this case both the transmit- and receive-chain gains must be individually balanced in order to achieve a gain vs. phase which is a circle.

There are various ways to avoid degeneracy in the alignment of the transmit and receive gain axes. If parameter control is adequate, the circuit layout in forming the injection signal path could be designed to be approximately an odd multiple of 45° . Alternatively, a modest phase-control

element could be included in the injection path, and capable of two difference phase shift values differing by approximately 45° .

FIG. 8 depicts a preferred embodiment where calibration based upon a phasor calibration signal with phase selection using phase control 140 is used to avoid degenerate alignment of the gain ellipses for transmit and receive. An initial calibration signal on one phase of the transmit baseband input should produce amplitudes in the receive baseband I and Q outputs which are of similar magnitude. If these magnitudes are too disparate, then existence of the nearly degenerate transmit/receiver phase alignment is indicated, and changing the phase by approximately $\pm 45^\circ$, is sufficient to guarantee non-degenerate phase alignment. This pre-calibration to avoid degenerate phase alignment could be performed for each calibration operation, or perhaps infrequently if parameters otherwise remain stable.

Yet another approach would be to modulate the phase in the injection path so that the axes do not remain, on the average, in a degenerate alignment. It is important to recognize the greater simplicity in this case, having to avoid a narrow range of phase shifts, compared to the earlier case in which the phase had to fall within a narrow range.

The basic calibration operation comprises applying the test signal as the baseband transmit signal input, holding the receive gains fixed, and sequentially varying the difference in I- and/or Q-channel gains in the transmit chain. The observable, the magnitude squared of the ghost signal in the case that the test signal is a phasor, will vary in a parabolic manner with gain difference in the transmit channel. The transmit gain difference which most nearly minimizes the observable is selected and then remains fixed. The process is now repeated while varying only the receive differential gain. This will also produce observable variations which vary in a parabolic manner with gain difference in the receive chain. The differential receive gain which most nearly minimizes the observable is selected and then remains fixed. This alternate variation of differential gain in one chain while that of the other chain is held fixed enables the global minimization of the observable, at which point both the transmit and receive chain will have attained I-Q balance.

The varying of differential I-Q gains in the transmit and receive chains can be effected in many ways. It can be applied in a true differential manner, although this is not necessary and it is generally simpler to vary either the I or Q gain while holding the other fixed. In addition, the gains may be applied digitally to the digital representations of the transmit and/or receive baseband samples, or digital control of analog gain within the transmit and/or receive baseband gain chain. All of these alternatives can be used in accordance with the principles of the present invention.

For bandwidth-efficient modulations it is likely that the frequency response of the I and Q channels can be made to match over frequencies of interest, hence requiring only a single gain adjustment to bring the I and Q channels into adequate balance. If this is not the case, then a series of phasors could be used sequentially, with each such phasor providing a spot frequency calibration. Of course, such a technique would require some form of equalizer to set the compensating gains at the set of spot frequencies.

For the single-gain case, a particularly convenient frequency for the test phasor is one quarter of the modulation pulse rate, which is the effective sampling rate for the calibration signal, although it should be understood that the present invention is not limited to the one quarter relationship. This signal may be produced by the sequence $\{1, j, -$

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1, -j} repeated for the duration of the calibration signal. The original phasor is, of course, the correlation reference for its ghost signal since they are conjugates. In particular, taking samples of the baseband receive signal after steady state when any amplitude transients due to filtering have ceased, a sequence of four samples would appear as $\{1+\gamma j, -j\gamma, -1-\gamma, -j+j\gamma\}$, where γ is the gain imbalance parameter. Multiplying this by the sequence $\{1, j, -1, -j\}$ and summing results in 4γ . Thus, if the total number of samples taken N is a multiple of four, then in correlation the original phasor component of the receive baseband signal produces identically zero, while the ghost phasor correlates perfectly to produce $N\gamma$. The coefficients used in correlation do not require any actual multiplies; rather, only additions and subtractions are used. Thus, this test signal may be processed in rather simple digital circuits.

The calibration process can be performed during the power-on cycle to attain initial operation, with switch 122 of FIG. 4, 5 or 8 being connected as shown. In this case convergence of the process might require several basic cycles of calibration, each comprising a transmit and a receive variation of gain, if both are being calibrated. Subsequently, at a rate consistent with parameter drift, for example due to self-heating of the circuitry, the calibration process can be used to update the differential gain settings. In this tracking mode the changes are likely to be small on each calibration cycle, and a number of algorithms can be used for the update process. A variety of algorithms exist for maintaining the desired operating point. One algorithm, called "tau-dither tracking" when applied to track signal timing in spread-spectrum communication systems and well known in the art, seeks to locate a maximum or minimum magnitude of a complex value by varying a parameter and using the parabolic nature of the magnitude dependence upon that parameter. Any of the algorithmic variations are consistent with the calibration techniques of the present invention.

Thus, the transmit signal is injected into the receive chain of the transceiver in order to support calibration independently of the I-Q gain balance of the both transmit and receive chains in their entirety, as required for proper operation among multiple users. This provides comprehensive I-Q gain balance, and in addition can be effected with non-critical circuit layout for the injection signal path. Furthermore, the calibration signals originate at baseband in the transmit channel, and can be observed at baseband in the receive channel. Consequently, there is minimal impact on the circuit layout to implement this calibration technique.

While this invention has been particularly shown and described with references to preferred embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention as defined by the following claims.

What is claimed is:

1. A transceiver system for transmitting and receiving data using both I and Q channels, comprising:

a transmit chain;
a receive chain; and

a calibration subsystem comprising a signal path for injecting a calibration RF signal, generated in response to and as a function of a signal generated through the transmit chain, into the receive chain of the transceiver in order to independently calibrate the I-Q gain balance of the both transmit and receive chains in their entirety; wherein the calibration RF signal includes a calibration cycle, and the calibration cycle determines transmitter

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I-Q gain settings which minimize an observable indicator while holding receive I-Q gain settings constant, and which in turn determines receiver I-Q gain settings which minimizes the observable indicator while holding the transmit I-Q gain settings constant.

2. A transceiver system according to claim 1, wherein the calibration signal originates at baseband in the transmit channel, and is observed at baseband in the receive channel.

3. A transceiver system according to claim 1, wherein the transceiver is a direct-conversion transceiver.

4. A transceiver system according to claim 1, wherein the transceiver is a heterodyne-conversion transceiver.

5. A transceiver system according to claim 1, further including a channel gain adjuster for varying the differential I-Q gain in the transmit and receive chains independently in response to the calibration signal being injected into the receiver chain.

6. A transceiver system according to claim 1, further including a channel gain adjuster for varying the differential I-Q gain in the imbalanced chain in response to the calibration signal being injected into the receiver chain.

7. A transceiver system comprising:

A. a transmit chain including: a signal generator for generating a baseband transmit signal; baseband I-Q amplification subsystem for providing baseband amplification of the baseband transmit signal; a direct-conversion subsystem for converting the baseband transmit signal to an RF transmit signal, and an RF transmit signal port;

B. a receive chain including: an RF receive port for receiving an RF receive signal; a direct-conversion subsystem for converting the RF receive signal to a baseband receive signal; a baseband I-Q amplification subsystem for providing amplification of the baseband receive signal;

a processor for processing of the baseband receive signal as required for the normal function of the transceiver, and

C. a calibration subsystem including: a calibration RF signal generator for generating a calibration RF signal as a baseband transmit signal; a signal path for injecting the calibration RF signal from the RF transmit signal port to the RF receive signal port; a processor for processing the baseband receive calibration RF signal to form an observable indicator of I-Q imbalance; and a channel gain adjuster for varying the differential I-Q gain in the transmit and receive chains independently wherein the calibration RF signal includes a calibration cycle, and the calibration cycle determines transmitter I-Q gain settings which minimize an observable indicator while holding receive I-Q gain settings constant, and which in turn determines receiver I-Q gain settings which minimizes the observable indicator while holding the transmit I-Q gain settings constant.

8. A transceiver system according to claim 7, further including means for preventing the signal path for injecting the calibration RF signal from permanently imparting an unfavorable net phase shift from baseband transmit to baseband receive.

9. A transceiver system according to claim 8, wherein the means for preventing the signal path for injecting the calibration RF signal from permanently imparting an unfavorable net phase shift from baseband transmit to baseband receive includes a phase-calibration cycling subsystem.

10. A transceiver system according to claim 8, wherein the means for preventing the signal path for injecting the calibration RF signal from permanently imparting an unfavorable net phase shift from baseband transmit to baseband receive includes a phase-calibration cycling subsystem.

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variable net phase shift from baseband transmit to baseband receive includes a slowly time-varying phase modulation subsystem.

11. A transceiver system according to claim 7, wherein the calibration RF signal includes a sequence of pulses taking on purely real or imaginary values at any instant.

12. A transceiver system according to claim 7, wherein the calibration RF signal includes a sampled phasor.

13. A transceiver system according to claim 7, wherein the calibration RF signal includes a discrete phasor.

14. A transceiver system according to claim 7, wherein the calibration RF signal includes a discrete phasor comprising j^n or j^{-n} .

15. A transceiver system according to claim 7, wherein the calibration RF signal includes successive calibration cycles, and successive calibration cycles are used to refine or maintain I-Q balance.

16. A transceiver system comprising:

A. a transmit chain including: a signal generator for generating a baseband transmit signal; baseband I-Q amplification subsystem for providing baseband amplification of the baseband transmit signal; direct-conversion subsystem for converting the baseband transmit signal to an RF transmit signal, and including an RF transmit signal port;

B. a receive chain including: an RF receive port for receiving an RF receive signal; direct-conversion subsystem for converting the RF receive signal to a baseband receive signal; baseband I-Q amplification subsystem for providing amplification of the baseband receive signal;

processing of the baseband receive signal as required for the normal function of the transceiver, and

C. a calibration subsystem including: a calibration RF signal generator for generating a calibration RF signal as a baseband transmit signal; a signal path for injecting the calibration RF signal from the RF transmit signal port to the RF receive signal port; a processor for processing the baseband receive calibration RF signal to form an observable indicator of I-Q imbalance; and, D. a channel gain adjuster for varying the differential I-Q gain in the imbalanced chain,

wherein the calibration RF signal includes a calibration cycle, and the calibration cycle determines transmitter I-Q gain settings which minimize an observable indicator while holding receive I-Q gain settings constant, and which in turn determines receiver I-Q gain settings which minimizes the observable indicator while holding the transmit I-Q gain settings constant.

17. A transceiver system according to claim 16, wherein the calibration RF signal includes a sequence of pulses taking on purely real or imaginary values at any instant.

18. A transceiver system according to claim 16, wherein the calibration RF signal includes a sampled phasor.

19. A transceiver system according to claim 16, wherein the calibration RF signal includes a discrete phasor.

20. A transceiver system according to claim 16, wherein the calibration RF signal includes a discrete phasor comprising j^n or j^{-n} .

21. A transceiver system according to claim 16, wherein successive calibration cycles are used to refine or maintain I-Q balance.

22. A transceiver system comprising:

A. a transmit chain including: a signal generator for generating a baseband transmit signal; a baseband I-Q amplification subsystem for providing baseband amplification of the baseband transmit signal; at least one

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stage of frequency conversion of the baseband transmit signal to an intermediate frequency; conversion subsystem for converting the baseband transmit signal at the intermediate frequency to an RF transmit signal, and including an RF transmit signal port;

B. a receive chain including: an RF receiving port for receiving an RF receive signal; at least one stage of frequency conversion of the receive signal to an intermediate frequency; a conversion subsystem for converting the RF receive signal to a baseband receive signal; baseband I-Q amplification subsystem for providing amplification of the baseband receive signal; processing of the baseband receive signal as required for the normal function of the transceiver, and

C. a calibration subsystem including: a calibration RF signal generator for generating a calibration RF signal as a baseband transmit signal; a signal path for injecting the calibration RF signal from the RF transmit signal port to the RF receive signal port; a processor for processing the baseband receive calibration RF signal to form an observable indicator of I-Q imbalance; and, channel gain adjuster for varying the differential I-Q gain in the transmit and receive chains independently

wherein the calibration RF signal includes a calibration cycle, and the calibration cycle determines the transmitter I-Q gain settings which minimize the observable indicator while holding the receive I-Q gain settings constant, and which in turn determines the receiver I-Q gain settings which minimizes the observable indicator while holding the transmit I-Q gain settings constant.

23. A transceiver system according to claim 22, further including means for preventing the signal path for injecting the calibration RF signal from permanently imparting an unfavorable net phase shift from baseband transmit to baseband receive.

24. A transceiver system according to claim 23, wherein the means for preventing the signal path for injecting the calibration RF signal from permanently imparting an unfavorable net phase shift from baseband transmit to baseband receive includes a phase-calibration cycling subsystem.

25. A transceiver system according to claim 23, wherein the means for preventing the signal path for injecting the calibration RF signal from permanently imparting an unfavorable net phase shift from baseband transmit to baseband receive includes a slowly time-varying phase modulation subsystem.

26. A transceiver system according to claim 22, wherein the calibration RF signal includes a sequence of pulses taking on purely real or imaginary values at any instant.

27. A transceiver system according to claim 22, wherein the calibration RF signal includes a sampled phasor.

28. A transceiver system according to claim 22, wherein the calibration RF signal includes a discrete phasor.

29. A transceiver system according to claim 22, wherein the calibration RF signal includes a discrete phasor comprising j^n or j^{-n} .

30. A transceiver system according to claim 22, wherein the calibration RF signal includes successive calibration cycles, and successive calibration cycles are used to refine or maintain I-Q balance.

31. A transceiver system according to claim 22, wherein the at least one stage of frequency conversion includes amplification means for amplifying the transmit signal at the intermediate frequency.

32. A transceiver system comprising:

A. a transmit chain including: a signal generator for generating a baseband transmit signal; a baseband I-Q

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amplification subsystem for providing baseband amplification of the baseband transmit signal; at least one stage of frequency conversion of the baseband transmit signal to an intermediate frequency; a conversion subsystem for converting the baseband transmit signal at the intermediate frequency to an RF transmit signal, and including an RF transmit signal port;

B. a receive chain including: an RF receiving port for receiving an RF receive signal; at least one stage of frequency conversion of the receive signal to an intermediate frequency; a conversion subsystem for converting the RF receive signal to a baseband receive signal; baseband I-Q amplification subsystem for providing amplification of the baseband receive signal; processing of the baseband receive signal as required for the normal function of the transceiver, and

C. a calibration subsystem including: a calibration RF signal generator for generating a calibration RF signal as a baseband transmit signal; a signal path for injecting the calibration RF signal from the RF transmit signal port to the RF receive signal port; a processor for processing the baseband receive calibration RF signal to form an observable indicator of I-Q imbalance; and, D. a channel gain adjuster for varying the differential I-Q gain in the imbalanced chain

wherein the calibration RF signal includes a calibration cycle, and the calibration cycle determines transmitter I-Q gain settings which minimize an observable indicator while holding receive I-Q gain settings constant, and which in turn determines receiver I-Q gain settings which minimizes the observable indicator while holding the transmit I-Q gain settings constant.

33. A transceiver system according to claim 32, wherein the calibration RF signal includes a sequence of pulses taking on purely real or imaginary values at any instant.

34. A transceiver system according to claim 32, wherein the calibration RF signal includes a sampled phasor.

35. A transceiver system according to claim 32, wherein the calibration RF signal includes a discrete phasor.

36. A transceiver system according to claim 32, wherein the calibration RF signal includes a discrete phasor comprising j^n or j^{-n} .

37. A transceiver system according to claim 32, wherein successive calibration cycles are used to refine or maintain I-Q balance.

38. A method of calibrating a transceiver system for transmitting and receiving data using both I and Q channels and including a transmit chain and a receive chain; the method comprising;

injecting a calibration RF signal, generated in response to and as a function of a signal generated through the transmit chain, into the receive chain of the transceiver in order to independently calibrate the I-Q gain balance of the both transmit and receive chains in their entirety; wherein the calibration RF signal includes a calibration cycle, and further including using the calibration cycle so as to determine transmitter I-Q gain settings so as to minimize an observable indicator while holding receive I-Q gain settings constant, and determining receiver I-Q gain settings so as to minimize the observable indicator while holding transmit I-Q gain settings constant.

39. A method according to claim 38, wherein the calibration RF signal originates at baseband in the transmit channel, and is observed at baseband in the receive channel.

40. A method according to claim 38, wherein the transceiver is a direct-conversion transceiver.

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41. A method according to claim 38, wherein the transceiver is a heterodyne-conversion transceiver.

42. A method according to claim 38, further including adjusting the channel gain so as to vary the differential I-Q gain in the transmit and receive chains independently in response to the calibration RF signal being injected into the receiver chain.

43. A method according to claim 38, further including adjusting the channel gain so as to vary the differential I-Q gain in the imbalanced chain in response to the calibration RF signal being injected into the receiver chain.

44. A method of calibrating a transceiver system for transmitting and receiving data using both I and Q channels and comprising (a) a transmit chain including a signal generator for generating a baseband transmit signal; baseband I-Q amplification subsystem for providing baseband amplification of the baseband transmit signal; direct-conversion subsystem for converting the baseband transmit signal to an RF transmit signal, and including an RF transmit signal port; and (b) a receive chain including an RF receive port for receiving an RF receive signal; direct-conversion subsystem for converting the RF receive signal to a baseband receive signal; baseband I-Q amplification subsystem for providing amplification of the baseband receive signal; a processor for processing of the baseband receive signal as required for the normal function of the transceiver, the method comprising:

generating a calibration RF signal as a baseband transmit signal; and

injecting the calibration RF signal from the RF transmit signal port to the RF receive signal port;

processing the baseband receive calibration RF signal to form an observable indicator of I-Q imbalance; and varying the differential I-Q gain in the transmit and receive chains independently

wherein the calibration RF signal includes a calibration cycle, and further including using the calibration cycle so as to determine the transmitter I-Q gain settings so as to minimize the observable indicator while holding the receive I-Q gain settings constant, and determining the receiver I-Q gain settings so as to minimize the observable indicator while holding the transmit I-Q gain settings constant.

45. A method according to claim 44, further including preventing the injection of the calibration RF signal from permanently imparting an unfavorable net phase shift from baseband transmit to baseband receive.

46. A method according to claim 45, wherein preventing the injection of the calibration RF signal from permanently imparting an unfavorable net phase shift from baseband transmit to baseband receive includes phase-calibration cycling.

47. A method according to claim 45, wherein preventing the injection of the calibration RF signal from permanently imparting an unfavorable net phase shift from baseband transmit to baseband receive includes slowly time-varying phase modulating.

48. A method according to claim 44, wherein generating the calibration RF signal includes generating a sequence of pulses taking on purely real or imaginary values at any instant.

49. A method according to claim 44, wherein the calibration RF signal includes a sampled phasor.

50. A method according to claim 44, wherein the calibration RF signal includes a discrete phasor.

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51. A method according to claim 44, wherein the calibration RF signal includes a discrete phasor comprising j^n or j^{-n} .

52. A method according to claim 44, wherein the calibration RF signal includes successive calibration cycles, and further including using the successive calibration cycles to refine or maintain I-Q balance.

53. A method of calibrating a transceiver system comprising (a) a transmit chain including a signal generator for generating a baseband transmit signal; baseband I-Q amplification subsystem for providing baseband amplification of the baseband transmit signal; a direct-conversion subsystem for converting the baseband transmit signal to an RF transmit signal, and an RF transmit signal port; and (b) a receive chain including an RF receive port for receiving an RF receive signal; a direct-conversion subsystem for converting the RF receive signal to a baseband receive signal; baseband I-Q amplification subsystem for providing amplification of the baseband receive signal; processing of the baseband receive signal as required for the normal function of the transceiver, the method comprising

generating a calibration RF signal as a baseband transmit signal;

injecting the calibration RF signal from the RF transmit signal port to the RF receive signal port;

processing the baseband receive calibration RF signal to form an observable indicator of I-Q imbalance; and varying the differential I-Q gain in the imbalanced chain so as to adjust the gain;

wherein the calibration RF signal includes a calibration cycle, and further including using the calibration cycle so as to determine transmitter I-Q gain settings so as to minimize an observable indicator while holding receive I-Q gain settings constant, and determining receiver I-Q gain settings so as to minimize the observable indicator while holding transmit I-Q gain settings constant.

54. A method according to claim 53, wherein generating the calibration RF signal includes generating a sequence of pulses taking on purely real or imaginary values at any instant.

55. A method according to claim 53, wherein the calibration RF signal includes a sampled phasor.

56. A method according to claim 53, wherein the calibration RF signal includes a discrete phasor.

57. A method according to claim 53, wherein the calibration RF signal includes a discrete phasor comprising j^n or j^{-n} .

58. A method according to claim 53, further including using successive calibration cycles to refine or maintain I-Q balance.

59. A method of calibrating a transceiver system comprising (a) a transmit chain including a signal generator for generating a baseband transmit signal; a baseband I-Q amplification subsystem for providing baseband amplification of the baseband transmit signal; at least one stage of frequency conversion of the baseband transmit signal to an intermediate frequency; a conversion subsystem for converting the baseband transmit signal at the intermediate frequency to an RF transmit signal, and an RF transmit signal port; and (b) a receive chain including an RF receiving port for receiving an RF receive signal; at least one stage of frequency conversion of the receive signal to an intermediate frequency; a conversion subsystem for converting the RF receive signal to a baseband receive signal; baseband I-Q amplification subsystem for providing amplification of the baseband receive signal; a processor for processing the

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baseband receive signal as required for the normal function of the transceiver, the method comprising generating a calibration RF signal as a baseband transmit signal;

injecting the calibration RF signal from the RF transmit signal port to the RF receive signal port;

processing the baseband receive calibration RF signal to form an observable indicator of I-Q imbalance; and varying the differential I-Q gain in the transmit and receive chains independently so as to adjust the differential I-Q gain so as to minimize any difference

wherein the calibration RF signal includes a calibration cycle, wherein the method further includes using the calibration cycle to determine the transmitter I-Q gain settings which minimize the observable indicator while holding the receive I-Q gain settings constant, and determining the receiver I-Q gain settings which minimizes the observable indicator while holding the transmit I-Q gain settings constant.

60. A method according to claim 59, further including preventing the injection of the calibration RF signal from permanently imparting an unfavorable net phase shift from baseband transmit to baseband receive.

61. A method according to claim 60, wherein preventing the injection of the calibration RF signal from permanently imparting an unfavorable net phase shift from baseband transmit to baseband receive includes a phase-calibration cycling.

62. A method according to claim 60, wherein preventing the injection of the calibration RF signal from permanently imparting an unfavorable net phase shift from baseband transmit to baseband receive includes slowly time-varying phase modulation.

63. A method according to claim 59, wherein the calibration RF signal includes a sequence of pulses taking on purely real or imaginary values at any instant.

64. A method according to claim 59, wherein the calibration RF signal includes a sampled phasor.

65. A method according to claim 59, wherein the calibration RF signal includes a discrete phasor.

66. A method according to claim 59, wherein the calibration RF signal includes a discrete phasor comprising j^n or j^{-n} .

67. A method according to claim 59, wherein the calibration RF signal includes successive calibration cycles, and the method further includes using successive calibration cycles to refine or maintain I-Q balance.

68. A method according to claim 59, wherein the at least one stage of frequency conversion includes amplification means for amplifying the transmit signal at the intermediate frequency.

69. A method of calibrating a transceiver system comprising: (a) a transmit chain including: a signal generator for generating a baseband transmit signal; a baseband I-Q amplification subsystem for providing baseband amplification of the baseband transmit signal; at least one stage of frequency conversion of the baseband transmit signal to an intermediate frequency; a conversion subsystem for converting the baseband transmit signal at the intermediate frequency to an RF transmit signal, and an RF transmit signal port; and (b) a receive chain including an RF receiving port for receiving an RF receive signal; at least one stage of frequency conversion of the receive signal to an intermediate frequency; a conversion subsystem for converting the RF receive signal to a baseband receive signal; baseband I-Q amplification subsystem for providing amplification of the baseband receive signal; and a processor for processing of

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the baseband receive signal as required for the normal function of the transceiver, the method comprising:
 generating a calibration RF signal as a baseband transmit signal;
 injecting the calibration RF signal from the RF transmit 5
 signal port to the RF receive signal port;
 processing the baseband receive calibration RF signal to form an observable indicator of I-Q imbalance; and,
 varying the differential I-Q gain in the imbalanced chain so as to balance the I-Q gain;
 wherein the calibration RF signal includes a calibration cycle, and further including using the calibration cycle so as to determine transmitter I-Q gain settings so as to minimize an observable indicator while holding receive I-Q gain settings constant, and determining receiver 15
 I-Q gain settings so as to minimize the observable indicator while holding transmit I-Q gain settings constant.

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70. A method according to claim 69, wherein the calibration RF signal includes a sequence of pulses taking on purely real or imaginary values at any instant.

71. A method according to claim 69, wherein the calibration RF signal includes a sampled phasor.

72. A method according to claim 69, wherein the calibration RF signal includes a discrete phasor.

73. A method according to claim 69, wherein the calibration RF signal includes a discrete phasor comprising j^n or j^{-n} .

74. A method according to claim 69, further including using successive calibration cycles to refine or maintain I-Q balance.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,346,313 B2
APPLICATION NO. : 10/379352
DATED : March 18, 2008
INVENTOR(S) : John H. Cafarella

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the claims

Column 13, line 32, insert --a processor for-- prior to “processing of the baseband receive signal as required for”.

Column 14, line 13, insert --a processor for-- prior to “processing of the baseband receive signal as required for”.

Column 15, line 15, insert --a processor for-- prior to “processing of the baseband receive signal as required for”.

Signed and Sealed this
First Day of November, 2016



Michelle K. Lee
Director of the United States Patent and Trademark Office

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,346,313 B2
APPLICATION NO. : 10/379352
DATED : March 18, 2008
INVENTOR(S) : John H. Cafarella

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

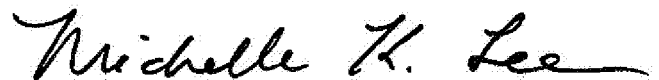
On the Title Page

Left column, immediately above the line that reads “(51) Int. Cl.” and immediately below the line that reads “US 2003/0223480 A1 Dec. 4, 2003” insert -- Related U.S. Application Data (60) Provisional Application No. 60/361,630, filed on March 4, 2002. --.

In the Specification

Column 1, Line 2, after “TRANSCIVERS” insert -- Related Applications - This application is related to and hereby claims priority to provisional application No. 60/361,630, filed March 4, 2002. --.

Signed and Sealed this
Thirty-first Day of January, 2017



Michelle K. Lee
Director of the United States Patent and Trademark Office

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION**

RED ROCK ANALYTICS LLC,
Plaintiff,

v.

APPLE INC., QUALCOMM INC.
Defendants.

Case No. 6:21-cv-00346-ADA

JURY TRIAL DEMANDED

**DEFENDANTS QUALCOMM INC. AND APPLE INC.'S OPPOSED MOTION TO
TRANSFER VENUE TO THE NORTHERN DISTRICT OF CALIFORNIA**

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EXHIBITS

The exhibits cited in this reply as “Ex. ___” are attached to the Declaration of Sarah Guske, filed as an attachment to this motion.

PRELIMINARY STATEMENT

Defendants Qualcomm Inc. and Apple Inc. respectfully request that the Court transfer this case to the Northern District of California pursuant to 28 U.S.C. § 1404(a).¹ None of the merits or evidence in the case has any connection to the Western District of Texas. Rather, the Defendants, known witnesses, and evidence are all found in California, with a heavy concentration in the NDCA, which is unsurprising given that the development of the accused functionality is performed in NDCA. For its part, Red Rock also has no connection to WDTX. It is a Florida corporation whose only known employee (who is also the named inventor) appears to be based outside Texas/WDTX. As such, all the key *Volkswagen* factors favor transfer to NDCA, and none favors keeping this case in WDTX.

I. STATEMENT OF FACTS

A. Red Rock Accuses Functionality Developed in California

Red Rock Analytics LLC’s Complaint accuses the “I-Q gain imbalance calibration” feature (“Accused Functionality”) in 5G and Wi-Fi 6 wireless transceivers of infringing claims of U.S. Patent No. 7,346,313 (the “’313 patent”). Ex. B to Red Rock First Amended Complaint (“FAC”) for Patent Infringement (D.I. 31) at 3. With respect to Qualcomm, Red Rock accuses Qualcomm’s 5G wireless transceivers (“Accused Qualcomm 5G Products”), as well as Qualcomm’s Wi-Fi 6 wireless transceivers “that comply in whole or in part with IEEE 802.11ax and/or later versions of IEEE 802.11” (“Accused Qualcomm Wi-Fi 6 Products,” collectively “Accused Qualcomm Products”). D.I. 31 ¶ 34. With respect to Apple, Red Rock accuses Apple’s products that include “5G wireless transceivers made by Qualcomm Inc. that comply in whole or in part with 3GPP

¹ Defendants do not concede that joinder is proper in this case and, by filing this motion jointly, do not waive any argument that Defendants were improperly joined. Defendants file this motion jointly merely for the convenience of the Court and in the interest of preserving judicial resources.

release 15 and/or later releases,” including “Qualcomm’s SDR865, SDX55M, and/or SMR526” products (“Accused Apple Products”). D.I. 31 ¶ 19.

B. Defendants’ Likely Witnesses and Documents are Located in NDCA and San Diego

1. Qualcomm’s Likely Trial Witnesses and Documents

Qualcomm is headquartered and its U.S. operations are based in California. Multiple offices are located in NDCA, including locations in Santa Clara and San Jose. Decl. of R. Vijayan ¶ 7; Decl. of A. Simon ¶¶ 7, 9. As of July 2021, approximately 13,007 of Qualcomm entities’ regular U.S.-based employees are based in California (representing 88.2% of Qualcomm entities’ U.S.-based employees), with approximately 1,693 based in NDCA, but only about 2.6% of Qualcomm entities’ regular U.S.-based employees are in Texas. Simon Decl. ¶¶ 6, 7, 15.

Critical to this case and the present motion, the groups that research, design, develop, and implement the Accused Functionality are located in California and not in Texas—let alone in this District. Anthony Simon tracks resources including project budget, scope, and schedule related to the research, design, development, and implementation of the Accused Qualcomm Wi-Fi 6 Products, and he is located in NDCA. *Id.* ¶¶ 2, 8. Mr. Simon and the majority of the team members responsible for the research, design, development, and implementation of calibration algorithms and techniques related to I-Q imbalance for the Accused Qualcomm Wi-Fi 6 Products are based in NDCA, including James Gardner, Senior Director of Technology; Michael Kohlmann, Vice President of Technology; Roger Brockenbrough, Senior Director of Technology; and Jayanand Asok Kumar, Engineer, Senior Staff. *Id.* at ¶¶ 9, 11–13. Rajiv Vijayan, a Vice President of Engineering, manages a team responsible for the research, design, and development of algorithms and techniques for calibration of I-Q imbalance for the Accused Qualcomm 5G Products and is located in San Diego. Vijayan Decl. ¶¶ 2, 6. Like for the Wi-Fi 6 products, the majority of

employees on the teams responsible for the research, design, development, and implementation of calibration algorithms and techniques related to I-Q imbalance for the Accused Qualcomm 5G Products are based in NDCA and San Diego, including Rahul Malik, Principal Engineer, Manager, and Christos Komninakis, Senior Director of Technology. *Id.* at ¶¶ 7, 9. U.S.-based finance personnel for Qualcomm also are in California. Vijayan Decl. ¶ 12; Simon Decl. ¶ 14.

In contrast to the numerous relevant Qualcomm teams and employees identified in NDCA or California, Qualcomm has not identified any employees in WDTX or Texas responsible for the Accused Functionality in the Accused Qualcomm Products. Vijayan Decl. ¶ 8; Simon Decl. ¶ 10. While Qualcomm does have some personnel in Texas, Qualcomm does not maintain an office in Waco and the employees who work at the Qualcomm offices in Austin and Richardson (which is not in this District) are not responsible for the research, design, development, or implementation of algorithms and techniques for calibration of I-Q imbalance for the Accused Qualcomm Products. Vijayan Decl. ¶¶ 13–20; Simon Decl. ¶¶ 15–22.

The electronic and paper records that may be relevant to the Accused Functionality are located in and accessible from NDCA and San Diego. Vijayan Decl. ¶ 21; Simon Decl. ¶ 23. The financial data relating to the Accused Qualcomm Products also are located in and accessible from NDCA or San Diego. Vijayan Decl. ¶ 12; Simon Decl. ¶ 14. Qualcomm has not identified any relevant documents that were generated in or are locally stored in WDTX or Texas.

2. Apple’s Likely Trial Witnesses and Documents

Apple is a California corporation headquartered in Cupertino, California, which is in NDCA. Decl. of Mark Rollins ¶ 3. Apple’s management, primary research and development, and marketing facilities are located in or near Santa Clara County, California, including cities such as Cupertino and Sunnyvale, all of which are located in NDCA. *Id.* As of August 2021, Apple has more than 35,000 employees who work in or near its Cupertino headquarters. *Id.*

As explained above, the accused I-Q calibration functionality in the Accused Apple Products is within the 5G chips designed and developed by Qualcomm. To the extent there are any relevant Apple technical witnesses, they are located in NDCA and San Diego. Sushant Salgar, a Senior Manager in Apple's RF Productization Team, is responsible for developing software tools for testing the Accused Apple Products. Mr. Salgar works in NDCA (Cupertino), where the majority of the team is located (other team members are located in San Diego and China). *Id.* ¶ 8. Kexin Ma is a Senior Manager in Apple's Cellular Product Software Group and is responsible for developing firmware that interfaces with the Qualcomm 5G transceivers. Mr. Ma and his team are located in San Diego, with other team members in NDCA (Cupertino). *Id.* ¶ 9. Robert Sorensen, an RF and Wireless Engineering Manager in Apple's RF Design Team, is responsible for integrating Qualcomm 5G transceivers in the Accused Apple Products. Mr. Sorensen and his team are located in NDCA (Santa Clara and Cupertino). *Id.* ¶ 9. Apple is not aware of any relevant engineers located in WDTX. *Id.* ¶¶ 7–10. Apple's expected marketing, licensing, and finance witnesses are also located in NDCA. Anush Venkatesan, a Product Marketing Manager, is knowledgeable about the marketing of the Accused Apple Products and is located in NDCA (Cupertino). Brian Ankenbrandt, a Manager in the IP Transaction Group, is knowledgeable about Apple's IP licensing practices relevant to this case and is located in NDCA (Cupertino). Mark Rollins, a Senior Finance Manager, is knowledgeable regarding financial information relating to the Accused Apple Products and is located in NDCA (Santa Clara). *Id.* ¶¶ 12–15.

Apple is not aware of any employees with relevant knowledge concerning the claims asserted against Apple who are located in WDTX, including the Apple location identified in the FAC at Paragraph 12. *Id.* ¶ 16. The employees working at Apple's Austin retail stores also are not involved with the Accused Functionality. *Id.*

The electronic and paper records that may be relevant to the Accused Functionality are located in or accessible from NDCA. *Id.* ¶ 7. The financial, licensing, and marketing data relating to the Accused Apple Products are also located in NDCA. *Id.* ¶ 11. Apple has not identified any relevant documents that were generated or are stored in WDTX. *Id.* ¶¶ 7, 11.

C. Red Rock Has No Connections to WDTX

Red Rock has no apparent connections to WDTX. According to the FAC, Red Rock is registered in Florida and maintains its principal place of business in Florida. D.I. 31 ¶ 1. John H. Cafarella, the sole named inventor on the '313 patent, is also the manager, registered agent, and only apparent employee of Red Rock. Ex. 1 (Red Rock LLC 2021 Annual Report). According to public records, Mr. Cafarella resides in Florida. *Id.*

D. Potential Third-Party Witnesses Are Concentrated in California

Third-party witnesses known to Qualcomm and/or Apple reside in California, either in NDCA or elsewhere in California nearer to NDCA than to WDTX. For example, in a previous litigation involving the Asserted Patent, Red Rock identified a consultant who lives in San Diego, California, whose “name appears on certain documents produced by Red Rock in this litigation” and who “may have knowledge regarding these documents.” Ex. 2 (Red Rock’s Initial Disclosures in Case No. 2:19-cv-00117) at 2.

Further, there are third-party witnesses located in NDCA with knowledge related to I-Q imbalance calibration. For example, Rishi Mohindra is a named inventor on multiple prior art patents and applications, including U.S. Pat. Nos. 6,744,829, 7,035,341, and 6,625,424. Ex. 12 (front page of Mohindra patents). Mr. Mohindra’s U.S. Pat. No. 6,717,981 is the only prior art reference substantively addressed by the Examiner and patentee during prosecution of the '313 Patent. Ex. 10 ('313 File History). In Red Rock’s FAC, it points to a paper purportedly describing the alleged importance of I-Q gain imbalance calibration that lists Tong Zhang as its first-named

author. D.I. 31; Simon Decl. ¶ 24. Mr. Mohindra and Mr. Zhang reside in NDCA according to public information. Ex. 3 (LinkedIn profiles for Rishi Mohindra and Tong Zhang).

II. LEGAL STANDARD

“For the convenience of parties and witnesses, in the interest of justice, a district court may transfer any civil action to any other district or division where it might have been brought.” 28 U.S.C. § 1404(a). In analyzing a motion to transfer under § 1404(a), the law of the regional circuit applies. *In re TS Tech USA Corp.*, 551 F.3d 1315, 1319 (Fed. Cir. 2008).

First, under § 1404(a), the moving party must show that the claims “might have been brought” in the proposed transferee district. *In re Volkswagen of Am., Inc.*, 545 F.3d 304, 312-13 (5th Cir. 2008) (“*Volkswagen II*”).

Second, the movant must show “good cause” by demonstrating that the “transferee venue is clearly more convenient” than the transferor district. *Volkswagen II* at 315. In evaluating convenience, the district court weighs both private and public interest factors. *In re Volkswagen AG*, 371 F.3d 201, 203 (5th Cir. 2004) (“*Volkswagen I*”). The private factors include: “(1) the relative ease of access to sources of proof; (2) the availability of compulsory process to secure the attendance of witnesses; (3) the cost of attendance for willing witnesses; and (4) all other practical problems that make trial of a case easy, expeditious and inexpensive.” *Id.* The public interest factors include: “(1) the administrative difficulties flowing from court congestion; (2) the local interest in having localized interests decided at home; (3) the familiarity of the forum with the law that will govern the case; and (4) the avoidance of unnecessary problems of conflict of laws of the application of foreign law.” *Id.*

The convenience of the witnesses is the most important factor in the transfer analysis. *See In re Apple Inc.*, 818 F. App'x 1001, 1003 (Fed. Cir. 2020) [hereinafter *Apple I*]; *In re Genentech, Inc.*, 566 F.3d 1338, 1343 (Fed. Cir. 2009); *Auto-Dril, Inc. v. Nat'l Oilwell Varco, L.P.*, No.

6:150cv00091, 2016 WL 6909479, at *7 (W.D. Tex. Jan. 28, 2016). Without a single witness in or near the transferor venue, there is “nothing on the other side of the ledger, [and] the factor strongly favors transfer.” *In re Samsung Elecs. Co., Ltd.*, 2021 WL 2672136, at *6 (Fed. Cir. June 30, 2021). Even in a case featuring most witnesses and evidence closer to the transferee venue with few or no convenience factors favoring the venue chosen by the plaintiff, the trial court should grant a motion to transfer. *In re Nintendo Co., Ltd.*, 589 F.3d 1194, 1198 (Fed. Cir. 2009); *see also, e.g., In re TracFone Wireless, Inc.*, Case No. 2021-136, D.I. 11 (Fed. Cir. Apr. 20, 2021); *In re Apple Inc.*, 979 F.3d 1332 (Fed. Cir. 2020) [hereinafter *Apple II*]; *In re Adobe Inc.*, 2020 WL 4308164 (Fed. Cir. July 28, 2020).²

III. ARGUMENT

The Court should transfer this case to NDCA because (1) Red Rock could have originally filed this case in NDCA and (2) NDCA is clearly a more convenient venue than WDTX under the *Volkswagen* factors.

A. Red Rock Could Have Filed this Action in NDCA

“The preliminary question under § 1404(a) is whether a civil action ‘might have been brought’ in the destination venue.” *Volkswagen*, 545 F.3d at 312 (quoting 28 U.S.C. § 1391). Apple maintains its headquarters in NDCA. Rollins Decl. ¶ 3. Qualcomm maintains its headquarters in California and operates several offices in NDCA (regular and established places of business). Simon Decl. ¶ 6. Under Red Rock’s broad allegations, Defendants conduct allegedly infringing activity in NDCA. D.I. 31, ¶ 31 (alleging infringement by Apple throughout the United States); *id.*, ¶ 40 (alleging infringement by Qualcomm throughout the United States); *see also id.*, ¶¶ 8–13 (alleging acts of infringement that also would allegedly occur in NDCA). Thus, NDCA

² The plaintiff’s choice of venue is not a distinct factor in the analysis. *Volkswagen II*, 545 F.3d at 314-15. Nor is the location of counsel. *Volkswagen I*, 371 F.3d at 206.

has personal jurisdiction over both Defendants under both general and specific jurisdiction and venue is proper for both Defendants under 35 U.S.C. § 1400(b).

B. NDCA Is a Clearly More Convenient Venue than WDTX

As outlined in the following chart and explained below, half of the private and public interest factors—including the important convenience of witnesses factor—favor transfer, the others are neutral, and none favors keeping the case in WDTX:

<i>Volkswagen</i> Factors	Weight
Relative Ease of Access to Sources of Proof	Favors Transfer (<i>see infra</i> , Section III.B.1).
Availability of Compulsory Process	Favors Transfer (<i>see infra</i> , Section III.B.2).
Inconvenience to Willing Witnesses	Favors Transfer (<i>see infra</i> , Section III.B.3).
All Other Practical Problems	Neutral (<i>see infra</i> , Section III.B.4).
Court Congestion	Neutral (<i>see infra</i> , Section III.B.5).
Local Interest	Favors Transfer (<i>see infra</i> , Section III.B.6).
Forum Familiarity with the Law	Neutral (<i>see infra</i> , Section III.B.7).
Avoidance of Unnecessary Conflicts of Law	Neutral (<i>see infra</i> , Section III.B.7).

This Court recently granted a motion to transfer to NDCA in *MasterObjects, Inc. v. Facebook, Inc.* where the Court found only two factors favored transfer, one weighed against transfer, and the rest were neutral. *See* Order Granting Defendant’s Motion to Transfer, Case No. 6:20-cv-00087, D.I. No. 86 at 12. Here, there is even more reason to grant transfer to NDCA, where half of the factors favor transfer and the other half are neutral. *See 10Tales, Inc. v. TikTok Inc.*, Case No. 6:20-CV-00810-ADA, 2021 WL 2043978 at *6 (W.D. Tex. May 21, 2021) (granting transfer to NDCA where “[h]alf of the factors under this analysis favor transfer,” “half of the factors are neutral,” and “[n]o factor favors keeping this case in this District”).

1. Relative Ease of Access to Sources of Proof

This factor strongly favors transfer because the relevant evidence is located in NDCA or San Diego. The relative ease of access to sources of proof considers the location of relevant evidence. *10Tales*, 2021 WL 2043978, at *2; *Volkswagen II*, 545 F.3d at 316. In patent infringement actions, “the bulk of the relevant evidence usually comes from the accused infringer, the place where the defendant’s documents are kept weighs in favor of transfer to that location.” *Apple II*, 979 F.3d 1332, 1340 (Fed. Cir. 2020) (citing *In re Genentech, Inc.*, 566 F.3d 1338, 1345 (Fed. Cir. 2009)). The relevant inquiry is to compare the two venues to determine the relative ease of access to sources of proof in the two forums. *See Apple II*, 979 F.3d at 1340.

Here, the relevant evidence is located in NDCA and San Diego. *See supra*, Section I.A. The research, design, and development of this Accused Functionality take place at Qualcomm’s facilities in NDCA and San Diego. Vijayan Decl. ¶¶ 6–8; Simon Decl. ¶¶ 8–9, 12–13. The relevant technical documents, including source code, are generated and located in NDCA and San Diego. Vijayan Decl. ¶ 21, Simon Decl. ¶ 23. Further, relevant Qualcomm documents related to financial information for the Accused Qualcomm Products are also generated and located in NDCA and San Diego. Vijayan Decl. ¶ 12, Simon Decl. ¶ 14. Similarly, any relevant Apple documents related to the integration and testing of the Qualcomm 5G transceivers in Apple’s products are generated and located in NDCA and San Diego. Rollins Decl. ¶ 7. Apple documents related to financial information of the Accused Apple Products are also generated and located in NDCA. Rollins Decl. ¶ 11. Apple’s licensing functions are located in NDCA, and thus any licensing documents would be located there as well. *Id.*

Conversely, there are no unique, relevant documents in WDTX. Qualcomm’s Austin office is not involved in the research, design, or development of the Accused Functionality in the Accused Qualcomm Products. Vijayan Decl. ¶¶ 8, 13–20; Simon Decl. ¶¶ 10, 15–22. Apple’s Austin

offices also are not involved in integrating or testing Qualcomm’s 5G chips in the Accused Apple Products. Rollins Decl. ¶ 16. Red Rock also does not appear to have any documents in WDTX. Red Rock’s single employee—who is also the sole named inventor—resides in Florida, and Red Rock’s principal place of business is in Florida. Ex. 1.

This Court recently granted a motion to transfer to NDCA on similar facts, finding that the first factor weighs in favor of transfer where the relevant documents “will likely come from the NDCA or somewhere else in California.” *10Tales*, 2021 WL 2043978, at *2. The same is true here, as all the relevant sources of proof are located in NDCA and San Diego. Thus, as in *10Tales*, this factor weighs in favor of transfer to NDCA.

2. Availability of Compulsory Process

The second private interest factor weighs in favor of transfer. It considers the availability of compulsory process to secure the attendance of witnesses, particularly non-party witnesses whose attendance may need to be secured by a court order. *10Tales*, 2021 WL 2043978, at *3; *Volkswagen II*, 545 F.3d at 316. A court may subpoena a witness to attend trial only (a) “within 100 miles of where the person resides, is employed, or regularly transacts business in person;” or (b) “within the state where the person resides, is employed, or regularly transacts business in person, if the person . . . is commanded to attend a trial and would not incur substantial expense.” FED. R. CIV. P. 45(c)(1)(A), (B)(ii); *Gemalto S.A. v. CPI Card Grp. Inc.*, No. 15-CA-0910, 2015 WL 10818740, at *4 (W.D. Tex. Dec. 16, 2015).

Defendants have identified third parties located in NDCA who are likely to have key knowledge relevant to this case and are likely to require a subpoena to compel their attendance at trial. As detailed in Section I.D, Rishi Mohindra and Tong Zhang are named inventors or authors on various prior art cited by the Asserted Patent and in Red Rock’s Complaint, and all appear to reside in NDCA. D.I. 31; Ex. 3. On the other hand, Defendants are not presently aware of any

third-party witnesses within the subpoena power of WDTX.

Therefore, this factor weighs in favor of transfer. *In re Samsung*, 2021 WL 2672136, at *6 (“Even if not all witnesses testify, with nothing on the other side of the ledger, the factor strongly favors transfer.”); *see Genentech*, 566 F.3d at 1345 (concluding that compulsory-process factor “weighs in favor of transfer” where “there is a substantial number of witnesses within the subpoena power of the Northern District of California and no witness who can be compelled to appear in the Eastern District of Texas”); *In re: Hulu, LLC*, 2021 WL 3278194, at *4 (Fed. Cir. Aug. 2, 2021) (“[W]here, as here, the movant has identified multiple third-party witnesses and shown that they are overwhelming located within the subpoena power of only the transferee venue, this factor favors transfer even without a showing of unwillingness for each witness.”).

3. Inconvenience to Willing Witnesses

The single most important factor in the transfer analysis—the convenience for willing witnesses—weighs heavily in favor of transfer. *See Apple II*, 818 Fed. Appx. at 1003; *In re Google Inc.*, 2017 WL 977038, at *3 (Fed. Cir. Feb. 23, 2017); *Genentech*, 566 F.3d at 1342.

Defendants’ likely witnesses are located in California. *See supra*, Section I.B. Likely witnesses include Qualcomm employees in NDCA and San Diego who research, design, and develop calibration algorithms and techniques related to I-Q imbalance for the Accused Qualcomm Products (*see supra*, Section I.B.1; Vijayan Decl. ¶¶ 7, 9; Simon Decl. ¶¶ 9, 11-13), Apple engineers in NDCA and San Diego who work on integrating and testing Qualcomm 5G Products in the Accused Apple Products (*see supra*, Section I.B.2; Rollins Decl. ¶¶ 7–10), and non-technical witnesses, respectively (*see supra*, Section I.B; Rollins Decl. ¶¶ 7–10). Red Rock itself cites documents in its FAC that identify Qualcomm personnel based in NDCA as authors, contributors, or inventors. D.I. 31 at Ex. B; Vijayan Decl. ¶¶ 22–23; Simon Decl. ¶¶ 24–25.

The witnesses in NDCA are a car ride from any NDCA courthouse, and the witnesses in

San Diego are less than two hours away by plane (with many daily non-stop flights to any of the three major airports in NDCA), which allows the witnesses in some instances to return to San Diego the same day. Exs. 4, 5 (flight and driving information from San Diego to San Jose). In contrast, if the case were to remain in WDTX, witnesses would travel nearly 1,500 miles to WDTX, with fewer non-stop flight options, as well as a lengthy car ride from the Austin or Dallas Fort Worth airports to Waco. Exs. 5–9 (flight and driving information from San Diego and San Jose to Austin and Dallas). This travel burden is significant and has often been cited as a key reason why transfer is appropriate. *See, e.g., Volkswagen II*, 545 F.3d at 317. This length of travel also imposes additional burdens, such as meal and lodging expenses. *Volkswagen I*, 371 F.3d at 204-205; *see also In re Acer America Corp.*, 626 F.3d 1252, 1255 (Fed. Cir. 2010).

In contrast, there are no identified witnesses who reside in WDTX. John Cafarella, the sole named inventor and only employee of Red Rock, is located in Florida. He would have to travel regardless of the venue, and thus the “‘100 mile rule’ should not be rigidly applied.” *In re 10Tales*, 2021 WL 2043978, at *4 (citing *In re Genentech, Inc.*, 566 F.3d at 1344); *see also Tracfone*, 2021 WL 1546036, at *3 (finding NDCA only “slightly” more inconvenient than WDTX for East Coast witnesses). Further, Defendants are unaware of any non-party witnesses for whom WDTX would be a more convenient forum. Thus, the convenience to the party and non-party witnesses—the vast majority of whom are located in NDCA or San Diego—weighs in favor of transfer under this factor. *In re Samsung*, 2021 WL 2672136, at *6.

In sum, it would be clearly more convenient for NDCA and San Diego-based witnesses to attend trial in NDCA. *Volkswagen II*, 545 F.3d at 317 (recognizing the “obvious conclusion” that “it is more convenient for witnesses to testify at home”); *see Apple II*, 979 F.3d at 1341-42. The facts here are analogous to *10Tales*, where the relevant witnesses also “resid[ed] in either the

NDCA or somewhere else in California.” *10Tales*, 2021 WL 2043978, at *4. Based on those facts, this Court found that “[r]ather than time-consuming and costly travel being inevitable regardless of venue, most witnesses here are faced with either extreme—NDCA as arguably the most convenient federal forum for such witnesses, or this District located over 1,300 miles further.” *Id.* As in *10Tales*, this factor weighs in favor of transfer to NDCA. *See also MasterObjects*, at 9 (weighing factor in favor of transfer to NDCA where there are a “significant amount of witnesses in California” and not “a single relevant witness in WDTX, let alone Texas”).

4. All Other Practical Problems

The final private interest factor—“all other practical problems that make trial of a case easy, expeditious, and inexpensive” (*Volkswagen II*, 545 F.3d at 314)—is neutral, as there are no co-pending cases involving the same technology before this Court. And as this Court has recognized, even if there were co-pending cases, that fact would not outweigh the Defendants’ strong presence in NDCA. *10Tales*, 2021 WL 2043978, at *4 (citing *In re Google Inc.*, No. 2017-107, 2017 WL 977038, at *2 (Fed. Cir. Feb. 23, 2017)).

5. Court Congestion

This factor concerns “whether there is an appreciable difference in docket congestion between the two forums.” *10Tales*, 2021 WL 2043978, at *5 (citing *Parsons v. Chesapeake & Ohio Ry. Co.*, 375 U.S. 71, 73 (1963)). As the Federal Circuit has observed, this is the “most speculative” factor, as “case-disposition statistics may not always tell the whole story.” *In re Genentech, Inc.*, 566 F.3d at 1347. At a minimum, this factor is neutral. The median time to trial between NDCA and WDTX for cases filed since January 1, 2016 slightly favors transfer—17.3 months in NDCA versus 23.9 in WDTX. *See* Ex. 11 (Docket Navigator); *see also Apple II*, 979 F.3d at 1343 (finding 25.9 months for NDCA versus 25.3 months for WDTX “comparable”). Further, this case is in its infancy; Defendants just responded to the First Amended Complaint on

July 14, 2021, and neither discovery nor a *Markman* hearing has occurred. As this Court found in *10Tales*, “a transfer at this stage of the litigation would not likely create any meaningful delays.” *10Tales*, 2021 WL 2043978, at *5 (finding this factor neutral after comparing court congestion between NDCA and WDTX). Both the transferor and the transferee jurisdictions will proceed to trial along a reasonable and prompt timeline.

6. Local Interest

The second public interest factor—whether there is a local interest in deciding local issues at home—strongly favors transfer. *See Volkswagen II*, 545 F.3d at 317. Under this factor, the Court must consider whether there are “significant connections between a particular venue and the events that gave rise to a suit.” *10Tales*, 2021 WL 2043978, at *5 (quoting *Apple II*, 979 F.3d at 1345). “One event particularly relevant to this analysis is the location of where ‘the accused products were designed, developed, and tested.’” *Id.*

This factor weighs in favor of transfer. Defendants’ strongest presence is in California, and the events giving rise to this case have “significant connections” with NDCA. As explained above, Red Rock’s complaint accuses a feature called “I-Q gain imbalance calibration” within Qualcomm’s 5G and Wi-Fi 6 wireless transceivers. Qualcomm’s work on the research, design, and development of the Accused Functionality related to the Accused Qualcomm Products occurs in NDCA or San Diego. *See supra*, Section I.B.1 (“Qualcomm’s Likely Witnesses and Documents”). Moreover, the engineering groups at Apple who are involved in integrating and testing the Qualcomm 5G transceivers in the Accused Apple Products are also located in NDCA. *See supra*, Section I.B.2. Thus, NDCA has a strong local interest in this matter because the research, design, and development of the accused products in the transferee forum are “significant factors” that provide “a legitimate interest in adjudicating the cases ‘at home.’” *In re Samsung*, 2021 WL 2672136, at *7 (citing *Apple II*, 979 F.3d at 1344–45).

In contrast, neither party has any “significant connections” to WDTX. Red Rock has no apparent connection to WDTX, much less any connections to the events that gave rise to the lawsuit. *See supra*, Section I.C. And while Qualcomm and Apple have a presence in WDTX, those are “general contacts with the forum that are untethered to the lawsuit” and should be discounted. *See In re Samsung*, 2021 WL 2672136, at *7 (citations omitted) (“The fact that infringement is alleged in the Western District of Texas gives that venue no more of a local interest than the Northern District of California or any other venue.”); *10Tales*, 2021 WL 2043978, at *5 (finding that “this sort of ‘general presence’ should not be given much consideration”).

This Court recently granted a motion to transfer to NDCA on similar facts, finding that the local interest factor weighed in favor of transfer to NDCA because “neither party ha[d] any ‘significant connections’ to this forum” and “significant connections” existed between NDCA and “events giving rise to th[e] suit”—the design, development, and testing of the accused products. *10Tales*, 2021 WL 2043978, at *5. The same is true here—neither Defendants nor Red Rock has any significant connections to WDTX, and significant connections exist between NDCA and the events giving rise to this suit.

7. Forum Familiarity with the Law and Avoidance of Unnecessary Conflicts of Laws

Finally, the last two factors are neutral, as there are no perceived conflicts of law and both districts are equally qualified to apply patent law.

IV. CONCLUSION

Based on the *Volkswagen* factors discussed above, NDCA is a “clearly more convenient forum” than WDTX, as half of the factors favor transfer, half are neutral, and no factor favors keeping the case in WDTX. Thus, Defendants respectfully request that this Court transfer this case to NDCA.

Dated: August 24, 2021

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CERTIFICATE OF CONFERENCE

In accordance with Local Rule CV-7(g), counsel for Defendants Apple and Qualcomm conferred in a good faith attempt to resolve the matter by agreement. The parties did not reach an agreement because Red Rock opposes the motion.

/s/ Douglas Kubehl
Douglas M. Kubehl

CERTIFICATE OF SERVICE

I hereby certify that all counsel of record who are deemed to have consented to electronic service are being served with a copy of the foregoing document via electronic mail on August 24, 2021.

/s/ Douglas Kubehl
Douglas M. Kubehl

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**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION**

RED ROCK ANALYTICS, LLC,

Plaintiff,

v.

APPLE INC., QUALCOMM INC.

Defendants.

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§

NO. 6:21-CV-00346-ADA

**DECLARATION OF ANTHONY SIMON IN SUPPORT OF DEFENDANT
QUALCOMM INCORPORATED'S MOTION TO TRANSFER VENUE TO THE
NORTHERN DISTRICT OF CALIFORNIA**

I, Anthony Simon, declare:

1. The facts set out below are based on my personal knowledge of, including my investigations into, the matters addressed below.

2. I am a Vice President of Program Management at Qualcomm Technologies, Inc. ("QTI"), which is a wholly-owned subsidiary of Qualcomm Incorporated ("Qualcomm"). QTI is the "chip-business" of Qualcomm which designs Qualcomm-branded semiconductor products. I joined Qualcomm's office in San Jose, California in August, 2015. I currently work at Qualcomm's office in San Jose, California, and reside in San Jose, California.

3. I understand that Red Rock Analytics, LLC ("Red Rock") has filed a lawsuit against Qualcomm and Apple Inc. (the "Lawsuit") on April 26, 2021.

4. It is my understanding that the products accused of infringement in the Lawsuit's complaint ("Complaint") include certain Qualcomm-branded products with a 5G transceiver

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("Accused Qualcomm 5G Products") and/or Wi-Fi 6 transceiver ("Accused Qualcomm Wi-Fi 6 Products") (collectively, "Accused Qualcomm Products"), which include the products listed in Exhibit A which is attached to this declaration.

5. It is my understanding that the allegations in the Complaint relate to calibration of I-Q imbalance for one or more of the following types of transceivers: 5G millimeter wave transceivers ("5G mmWave"), 5G sub-6 GHz ("5G sub-6") transceivers, and Wi-Fi 6 transceivers.

Activities in Qualcomm's California Offices

6. Qualcomm is headquartered in San Diego, California. Qualcomm and its related entities employ approximately 13,007 out of 14,752 of its regular U.S.-based employees (including employees of QTI) in the State of California.

7. Qualcomm and its related entities employ approximately 1,693 of its regular U.S.-based employees (including employees of QTI) in the Northern District of California, which includes offices in Santa Clara and San Jose, California ("California Bay Area Offices").

8. As Program Manager at QTI, my responsibilities include program management for QTI's Wi-Fi 6 products. My team within QTI is responsible for tracking resources (e.g., budget, project scope, schedule) related to the research, design, and development of Qualcomm-branded Wi-Fi 6 products, including the research, design, and development of algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm Wi-Fi 6 Products.

9. The teams responsible for the research, design, and development of algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm Wi-Fi 6 Products include the WLAN systems, RFA connectivity design, and RF systems teams. The teams responsible for implementing the algorithms include the Wi-Fi physical layer, firmware, and hardware systems teams. Based on my own knowledge and based on my investigation, employees

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from these teams report to managers in the California Bay Area and San Diego, California and are based in the California Bay Area Offices, in San Diego, California, or outside the U.S.

10. I have not identified any Qualcomm entity employees in the teams described in Paragraph 9 as they relate to any calibration of I-Q imbalance for the Accused Qualcomm Wi-Fi 6 Products that are based in Austin, Texas, Richardson, Texas, or elsewhere in Texas.

11. I understand that the following individuals have knowledge that is relevant to algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm Wi-Fi 6 Products. These individuals are QTI employees with experience in one or more of the teams discussed in Paragraph 9:

- a. James Gardner, Senior Director, Technology, based in Qualcomm's San Jose office, is part of the WLAN systems team that is responsible for the research, design, and development of any RF and mixed-signal calibration of I-Q imbalance for the Accused Qualcomm Wi-Fi 6 Products.
- b. Michael Kohlmann, Vice President, Technology, based in Qualcomm's San Jose office, is part of the RF Systems team that is responsible for designing and developing specifications for RF radios and transceivers, which includes developing any necessary configurations relating to any calibration of I-Q imbalance for the Accused Qualcomm Wi-Fi 6 Products.
- c. Roger Brockenbrough, Senior Director, Technology, based in Qualcomm's San Jose office, is part of the RFA connectivity design team that is responsible for designing the Wi-Fi radios (e.g., mixed-signal, analog radios) for the Accused Qualcomm Wi-Fi 6 Products.

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d. Jayanand Asok Kumar, Engineer, Senior Staff, based in Qualcomm's San Jose office, is part of the Wi-Fi physical layer team that is responsible for designing the digital circuits in the physical layer for the Accused Qualcomm Wi-Fi 6 Products.

12. I understand that the WLAN systems, RFA connectivity design, and RF Systems teams in Qualcomm's California Bay Area Offices design the algorithms relating to any calibration of I-Q imbalance for the Accused Qualcomm Wi-Fi 6 Products.

13. The Wi-Fi physical layer, firmware, and hardware systems teams that implement the algorithms for Wi-Fi 6 are also based in San Jose, California.

14. The U.S.-based finance group for Qualcomm-branded Wi-Fi 6 products is based in Qualcomm's California offices in San Diego and San Jose. The group maintains sales data, forecasts, and other relevant financials for the Accused Qualcomm Wi-Fi 6 Products.

Activities in Qualcomm's Texas Offices

15. I understand that Qualcomm has an office located in Austin and another in Richardson, Texas. Qualcomm and its related entities employ approximately 391 of its regular U.S.-based employees (including employees of QTI) in the State of Texas.

16. I also understand that Qualcomm does not have an office in Waco, Texas. QTI has one employee who works remotely from his residence in Waco, Texas. The employee works on a system-on-a-chip (SOC) architecture team that establishes standardized bus protocols and designs digital circuits in chipsets. This employee is not now and has never been part of the teams described in Paragraph 9 for Wi-Fi 6 and is not responsible for algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm Wi-Fi 6 Products.

17. I understand that approximately 372 of Qualcomm and its related entities' regular U.S.-based employees (including employees of QTI) work in Qualcomm's Austin office. As

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explained below, I understand that none of the employees in Qualcomm's Austin office are responsible for algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm Wi-Fi 6 Products.

18. I understand that among the employees in Qualcomm's office in Austin, Texas are members of the digital signal processor (DSP) team. The DSP team is not responsible for the research, design, and development of algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm Wi-Fi 6 Products. The DSP team develops and designs DSPs. The DSP team based in Austin also is not responsible for writing software for or designing DSPs specific to calibration of I-Q imbalance for the Accused Qualcomm Wi-Fi 6 Products.

19. I further understand that the other employees based in Qualcomm's office in Austin are not responsible for the research, design, and development of algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm Wi-Fi 6 Products.

20. I understand that approximately 19 of Qualcomm and its related entities' regular U.S.-based employees (including employees of QTI) work in Qualcomm's Richardson office. I understand that no employees in Qualcomm's Richardson office are responsible for algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm Wi-Fi 6 Products.

21. I understand that among the employees in Richardson, Texas are employees who assist the Radio Frequency Integrated Circuit (RFIC) team. The Richardson employees who assist the RFIC team joined QTI in 2019. I understand that the employees who assist the RFIC team based in Richardson, Texas are not responsible for algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm Wi-Fi 6 Products.

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22. I further understand that the other employees based in Qualcomm's office in Richardson are not responsible for the research, design, and development of algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm Wi-Fi 6 Products.

Location of Documents Related to Accused Wi-Fi 6 Technologies

23. I understand that documentation and other materials related to the algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm Wi-Fi 6 Products are generated by employees in Qualcomm's California Bay Area Offices or San Diego Offices, where the teams described in Paragraph 9 for Wi-Fi 6 are based. Additionally, such documents and other materials are stored on servers, or stored locally in computers or available in hard copy at Qualcomm's California Bay Area Offices or San Diego Offices.

Qualcomm Employees Identified by the First Amended Complaint

24. It is my understanding that Red Rock's June 30, 2021 First Amended Complaint attaches an exhibit that cites to several patents and publications that have contributors or inventors who are QTI employees:

- a. U.S. Patent No. 10,116,485 ("the '485 Patent"),
- b. U.S. Patent No. 8,478,222 ("the '222 Patent"), and
- c. T. Zhang et al., A Precision Wideband Quadrature Generation Technique with Feedback Control for Millimeter-Wave Communications Systems, IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, Vol. 66, No. 1 (Jan. 2018) ("the Zhang paper").

25. I understand that the following contributors or inventors of the materials listed in Paragraph 24 are employed by QTI at Qualcomm's California Bay Area offices. Specifically:

- a. Tienyow Liu, James Gardner, and Jayananad Asok Kumar (for the '485 Patent).

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- b. James Gardner and Vincent K. Jones (for the '222 Patent).
- c. Mazhareddin Taghivand (for the Zhang paper).
- d. Roger Brockenbrough, Beomsup Kim, and Mohammad Mahdi Ghahramani
(acknowledged in the Zhang paper).

26. To my knowledge, none of the contributors to the patents and publications described in Paragraph 24, above, are employed by Qualcomm or its related entities at any of Qualcomm's offices within the State of Texas.

27. I declare under penalty of perjury that the foregoing is true and correct.

Executed on August 13, 2021

DocuSigned by:
/s/ *Anthony Simon*
D92D801A5BDC4B1...
Anthony Simon

CONFIDENTIAL – ATTORNEYS’ EYES ONLY

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION**

RED ROCK ANALYTICS, LLC,

Plaintiff,

v.

APPLE INC., QUALCOMM INC.

Defendants.

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NO. 6:21-CV-00346-ADA

**DECLARATION OF RAJIV VIJAYAN IN SUPPORT OF DEFENDANT QUALCOMM
INCORPORATED’S MOTION TO TRANSFER VENUE TO THE NORTHERN
DISTRICT OF CALIFORNIA**

I, Rajiv Vijayan, declare:

1. The facts set out below are based on my personal knowledge of, including my investigations into, the matters addressed below.

2. I am a Vice President of Engineering at Qualcomm Technologies, Inc. (“QTI”), which is a wholly-owned subsidiary of Qualcomm Incorporated (“Qualcomm”). QTI is the “chip-business” of Qualcomm which designs Qualcomm-branded semiconductor products. I joined Qualcomm’s office in San Diego, California in August, 1993. I currently work at Qualcomm’s office in San Diego, California, and reside in San Diego, California.

3. I understand that Red Rock Analytics, LLC (“Red Rock”) has filed a lawsuit against Qualcomm and Apple Inc. (the “Lawsuit”) on April 26, 2021.

4. It is my understanding that the products accused of infringement in the Lawsuit’s complaint (“Complaint”) include certain Qualcomm-branded products with a 5G transceiver (“Accused Qualcomm 5G Products”) and/or Wi-Fi 6 transceiver (“Accused Qualcomm Wi-Fi 6

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Products”) (collectively, “Accused Qualcomm Products”), which include the products listed in Exhibit A which is attached to this declaration.

5. It is my understanding that the allegations in the Complaint relate to calibration of I-Q imbalance for one or more of the following types of transceivers: 5G millimeter wave (“5G mm Wave”) transceivers, 5G sub-6 GHz (“5G sub-6”) transceivers, and Wi-Fi 6 transceivers.

Activities in Qualcomm’s California Offices

6. As Vice President of Engineering at QTI, my responsibilities include managing QTI’s Radio Frequency Platform and Interfaces (“RFPI”) technology team for Qualcomm-branded 5G products. The RFPI technology team within QTI is responsible for the research, design, and development of algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm 5G Products, among other responsibilities.

7. Additional teams responsible for the research, design, and development (including implementation) of the algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm 5G Products include the RF systems, RF software, modem firmware, modem hardware, RFIC, and Product Test Engineering (PTE) teams. Based on my own knowledge and based on my investigation, employees from these teams are based in Qualcomm’s Santa Clara and San Jose, California (“California Bay Area Offices”); San Diego, California offices; or outside of the U.S.

8. I have not identified any Qualcomm entity employees in the teams described in Paragraphs 6 and 7 as they relate to any calibration of I-Q imbalance for the Accused Qualcomm 5G Products that are based in Austin, Texas, or Richardson, Texas or elsewhere in Texas.

9. I understand that the following individuals have knowledge that is relevant to algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm

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5G Products. These individuals are QTI employees with experience in one or more of the groups discussed in Paragraphs 6 and 7:

- a. Rahul Malik, Principal Engineer, Manager based in Qualcomm’s San Diego Offices, is part of the RFPI technology team that is responsible for the research, design, and development of algorithms and techniques relating to any calibration of I-Q imbalance related to 5G mmWave transceivers for the Accused Qualcomm 5G Products.
- b. Christos Komninakis, Senior Director of Technology based in Qualcomm’s San Diego Offices, was part of the RFPI technology team that is responsible for the research, design, and development of algorithms and techniques relating to any calibration of I-Q imbalance related to 5G sub-6 transceivers for the Accused Qualcomm 5G Products.

10. I understand that the RFPI technology team, the RF software team, and the modem firmware team design and develop software related to algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm 5G Products.

11. I understand that the RF software team also develops documentation and tools to provide to customers related to the algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm 5G Products.

12. The U.S.-based finance group for the Accused Qualcomm 5G Products is based in Qualcomm’s California offices in San Diego and San Jose. The group maintains sales data, forecasts, and other relevant financials for the Accused Qualcomm 5G Products.

Activities in Qualcomm’s Texas Offices

13. I understand that Qualcomm has an office located in Austin and another in Richardson, Texas.

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14. I also understand that Qualcomm does not have an office in Waco, Texas. QTI has one employee who works remotely from his residence in Waco, Texas. The employee works on a system-on-a-chip (SOC) architecture team that establishes standardized bus protocols and designs digital circuits in chipsets. This employee is not now and has never been part of the teams described in Paragraphs 6 and 7 and is not responsible for algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm 5G Products.

15. As explained below, I understand that none of the employees in Qualcomm’s Austin office are responsible for algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm 5G Products.

16. I understand that among the employees in Qualcomm’s office in Austin, Texas are members of the digital signal processor (DSP) team. The DSP team is not responsible for the research, design, and development of algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm 5G Products. The DSP team develops and designs DSPs and is not responsible for writing software for or designing DSPs specific to calibration of I-Q imbalance for the Accused Qualcomm 5G Products.

17. I further understand that the other employees based in Qualcomm’s office in Austin are not responsible for the research, design, and development of algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm 5G Products.

18. I understand that approximately 19 of Qualcomm’s and its related entities’ regular U.S.-based employees (including employees of QTI) work in Qualcomm’s Richardson office. I understand that no employees in Qualcomm’s Richardson office are responsible for algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm 5G Products.

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19. I understand that among the employees in Richardson, Texas are employees who assist the Radio Frequency Integrated Circuit (RFIC) team. The Richardson employees who assist the RFIC team joined QTI in 2019. I understand that the employees who assist the RFIC team based in Richardson, Texas are not responsible for algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm 5G Products.

20. I further understand that the other employees based in Qualcomm’s office in Richardson are not responsible for the research, design, and development of algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm 5G Products.

Location of Documents Related to Accused 5G mmWave and sub-6 Technologies

21. I understand that documentation and other materials related to the algorithms and techniques relating to any calibration of I-Q imbalance for the Accused Qualcomm 5G Products are generated by employees in Qualcomm’s California Bay Area Offices or San Diego Offices, where the teams described in Paragraphs 6 and 7 for 5G are based. Additionally, such documents and other materials are stored on servers, or stored locally in computers or available in hard copy at Qualcomm’s California Bay Area Offices or San Diego Offices.

Qualcomm Employees Identified by the First Amended Complaint

22. It is my understanding that Red Rock’s June 30, 2021 First Amended Complaint attaches an exhibit that cites to several patents and publications that have contributors or inventors who are QTI employees, including U.S. Patent Publication No. 2020/0029345 (“the ’345 Publication”).

23. It is my understanding several contributors on the publication described in Paragraph 22, above, are employed by QTI at Qualcomm’s offices in Qualcomm’s California Bay Area offices, or in San Diego, California. Specifically, Rahul Malik, Jong Hyeon Park, Udara

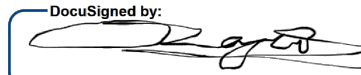
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Fernando, Alexei Yurievitch Gorokhov, Nan Zhang, Junsheng Han, Scott Hoover, and Ruhua He, are eight of the inventors named on the ’345 Publication.

24. To my knowledge, none of the contributors to the publication described in Paragraph 22, above, are employed by Qualcomm or its related entities at any of Qualcomm’s offices within the State of Texas.

25. I declare under penalty of perjury that the foregoing is true and correct.

Executed on August 16, 2021

/s/ 
DocuSigned by:
4289A373951E45E...
Rajiv Vijayan

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION**

RED ROCK ANALYTICS LLC,

Plaintiff,

v.

APPLE INC., QUALCOMM, INC.,

Defendants.

Civil Action No. 6:21-CV-00346-ADA

**DECLARATION OF MARK ROLLINS IN SUPPORT OF
DEFENDANTS' MOTION TO TRANSFER VENUE**

I, Mark Rollins, hereby declare:

1. I am over 18 years of age and competent to make this declaration. I am employed as a Finance Manager at Apple Inc. ("Apple"), and my primary place of work is Cupertino, California. I have been employed by Apple since 2019.

2. I provide this declaration in support of Defendants' Motion to Transfer Venue Under 28 U.S.C. § 1404(a) to the Northern District of California ("NDCA") filed in the above-captioned case. Unless otherwise indicated below, the statements in this declaration are based upon my personal knowledge, my review of corporate records maintained by Apple in the ordinary course of business, and/or my discussions with Apple employees. If called to testify as a witness in this matter, I could and would testify competently and truthfully to each statement in this declaration under oath.

3. Apple is a California corporation and was founded in 1976. Apple is a global business headquartered in Cupertino, California, which is in the NDCA. I understand that the NDCA includes the following counties: Alameda, Contra Costa, Del Norte, Humboldt, Lake,

Marin, Mendocino, Monterey, Napa, San Benito, San Francisco, San Mateo, Santa Clara, Santa Cruz, and Sonoma. Apple's management and primary research and development facilities are located in or near Cupertino, California, including surrounding cities such as Sunnyvale, all of which are located in the NDCA. The primary operation, marketing, sales, and finance decisions for Apple also occur in or near Cupertino, and Apple business records related to product revenue are located there. As of August 2021, Apple has more than 35,000 employees who work in or near its Cupertino headquarters.

4. I understand that Red Rock Analytics LLC ("Red Rock") filed the above-captioned patent infringement lawsuit against Apple in the United States District Court for the Western District of Texas ("WDTX"). In its Amended Complaint for Patent Infringement filed on June 30, 2021 ("Amended Complaint"), Plaintiff alleges infringement of U.S. Patent No. 7,346,313 ("313 patent") titled "Calibration of I-Q Balance in Transceivers." Amended Complaint ¶ 17, Exhibit A.

5. Based on the Amended Complaint, I understand that Red Rock accuses Apple's products that include "5G wireless transceivers made by Qualcomm Inc. that comply in whole or in part with 3GPP release 15 and/or later releases," including "Qualcomm's SDR865, SDX55M, and/or SMR526" chips. Amended Complaint ¶ 19. The Amended Complaint specifically accuses "the iPhone 12, iPhone 12 mini, iPhone 12 Pro, and iPhone 12 Pro Max." *Id.* I further understand that Red Rock accuses the "I-Q gain imbalance calibration" in the Qualcomm 5G transceivers used in the accused Apple products. Amended Complaint, Exhibit B at 3 ("Red Rock contends that every Accused Product performs I-Q gain imbalance calibration in an identical or substantially similar manner."). For purposes of my Declaration, I will refer to the Apple products equipped with Qualcomm 5G transceivers as the "Apple Accused Products."

6. Based on my discussions with Sushant Salgar, Kexin Ma, and Robert Sorensen, I understand that the accused I-Q gain imbalance calibration functionality in Qualcomm's 5G transceivers is designed and developed by Qualcomm and not by Apple. Further, based on these discussions, I understand that Apple does not have access to or knowledge about the details of how Qualcomm's 5G transceivers perform I-Q gain imbalance calibration because Qualcomm does not provide Apple with the source code or other documentation that describes how the I-Q gain imbalance calibration works in the Qualcomm 5G transceivers used in the Accused Apple Products.

7. Based on my discussions with Sushant Salgar, Kexin Ma, and Robert Sorensen, I understand that all of Apple's engineers who are involved with testing or integrating the Qualcomm 5G transceivers in the Apple Accused Products are located in the NDCA, San Diego and China, and that Apple has no employees located in the WDTX who are involved in testing or integration of the Qualcomm 5G transceivers in the Apple Accused Products. Based on these discussions, I understand that working files, electronic documents, source code, and any hard copy documents concerning testing or integration of the Qualcomm 5G transceivers in the Apple Accused Products reside on local computers and/or servers located in the NDCA, and that Apple does not have unique working files or documents relevant to this case located in the WDTX.

8. Sushant Salgar is a Senior Manager in Apple's RF Productization Team, and is part of the RF System, Algorithms, and Calibration ("RFSAC") subgroup. Mr. Salgar and his team are responsible for developing the software tools for calibrating and verifying all Apple products containing cellular chipsets, including the Apple Accused Products. Mr. Salgar works in Cupertino, California, where the majority of the team is located. There are currently seven team members located in China, and two team members located in San Diego. Mr. Salgar confirmed to

me that no Apple engineers who are involved with calibration and verification of Qualcomm 5G transceivers are located in Texas. He also does not work with any team members in Texas in connection with calibration and verification of Qualcomm 5G transceivers in the Apple Accused Products. The actual testing of the Apple Accused Products occurs in Apple's factories located in China.

9. Kexin Ma is a Senior Manager in Apple's Cellular Product Software Group. Mr. Ma and his team are responsible for developing firmware to interface with the Qualcomm 5G transceivers. The Cellular Product Software Group is located in Cupertino, California and San Diego, California. Mr. Ma works in San Diego. Mr. Ma confirmed to me that none of his team is located in Texas. He also does not work with any team members in Texas on the Accused Apple Products.

10. Robert Sorensen is an RF and Wireless Engineering Manager in Apple's RF Design Team. Mr. Sorensen and his team are responsible for integrating Qualcomm 5G transceivers in the Accused Apple Products. The RF Design Team is located in Cupertino, California and Santa Clara, California. Mr. Sorensen works in Santa Clara. Mr. Sorensen confirmed to me that none of his team is located in Texas. He also does not work with any team members in Texas on the Accused Apple Products.

11. Nearly all Apple employees who have knowledge relevant to marketing, licensing, and financial records related to the Accused Products work in or near the NDCA. I am not aware of any Apple employee who has unique information relevant to this case and is located in the WDTX. Working files, electronic documents, and business records related to the marketing, licensing, and financial records of the Apple Accused Products reside on local computers and/or servers either located in or around the NDCA or accessible in the NDCA. I am not aware of any

unique Apple working files or documents located in the WDTX that are relevant to this case.

12. The Apple employees whom Apple expects will be witnesses and who have knowledge relevant to marketing, licensing or financials are Anush Venkatesan, Brian Ankenbrandt, and me. As described below, all these individuals—including myself—have a primary workplace in or near the NDCA. I am not aware of any anticipated witnesses of Apple located in the WDTX.

13. Mr. Venkatesan is a Manager in the Carrier Partner Marketing Team. Mr. Venkatesan's primary workplace is in Cupertino, California. Mr. Venkatesan and his team are responsible for marketing for Apple's products with cellular chips, including the Apple Accused Products. Mr. Venkatesan also confirmed that the primary place of work for employees on his team is in the NDCA. Neither Mr. Venkatesan nor any employee on his team is located in the WDTX.

14. Brian Ankenbrandt is a Manager in the Intellectual Property Transaction Group at Apple. Mr. Ankenbrandt's primary workplace is in Cupertino, California. Mr. Ankenbrandt and his team are responsible for intellectual property licensing at Apple. Mr. Ankenbrandt confirmed that he is knowledgeable about licensing of intellectual property, including patent rights, by and to Apple. Mr. Ankenbrandt also confirmed that the primary place of work for employees on his team is in the NDCA with the exception of two individuals (both based remotely in Colorado). Neither Mr. Ankenbrandt nor any employee on his team is located in the WDTX. Mr. Ankenbrandt confirmed that neither he nor any of his team members regularly works with any individuals located in Texas in the normal course of their work.

15. I am knowledgeable about Apple's sales and financial information concerning the Apple Accused Products. My primary workplace is in the NDCA. The primary place of work of

employees on my team is the NDCA. Documents concerning sales and financial information for these products reside on local computers and/or servers either located in or around the NDCA or accessible in the NDCA. Neither I nor any employee on my team is located in Texas. None of my team members works with any individuals located in Texas with respect to financials relevant to the Apple Accused Products in this matter.

16. As of the date of this declaration, Apple operates over 270 retail stores in the United States, more than 50 of which are in California, including 19 stores in the NDCA. In WDTX, Apple has two retail stores in Austin, two retail stores in San Antonio, and one store in El Paso. I am not aware of any retail employee in these retail stores who was ever involved with the I-Q calibration features of Qualcomm's 5G transceivers in the Apple Accused Products. To the extent that any of the Apple Accused Products are sold in the WDTX, they are and were sold nationwide, and are not offered in any manner or degree differently than they are offered elsewhere. Apple has non-retail offices in Austin and Lockhart, Texas (located in the WDTX). To the best of my knowledge, however, none of the Apple employees with relevant information relating to the I-Q calibration features of Qualcomm's 5G transceivers in the Apple Accused Products works at these offices or reside in Texas.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on August 18, 2021, in Santa Clara, California.



Mark Rollins

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**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION**

RED ROCK ANALYTICS, LLC,

Plaintiff,

v.

APPLE INC., QUALCOMM, INC.,

Defendants.

Civil Action No. 6:21-cv-00346-ADA

JURY TRIAL DEMANDED

**RED ROCK’S RESPONSE IN OPPOSITION TO DEFENDANTS’ MOTION
TO TRANSFER VENUE UNDER 28 U.S.C. § 1404(a)**

PUBLIC VERSION

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Rockstar Consortium LP v. Google Inc.

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VirtualAgility, Inc. v. Salesforce.com, Inc.

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Weatherford Tech. Holdings, LLC v. Tesco Corp.

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Web Telephony, LLC v. Comcast Corp.

2010 WL 3860305 (E.D. Tex. Sept. 30, 2010) 5

CONFIDENTIAL – ATTORNEYS’ EYES ONLY**TABLE OF EXHIBITS**

EX. No.	DESCRIPTION
DEPOSITIONS	
1	Deposition transcript of Rajiv Vijavan, taken on November 17, 2021 (Attorney’s Eyes Only, highlighting added)
2	Deposition transcript of Mark Rollins, taken on November 19, 2021 (Attorney’s Eyes Only, highlighting added)
3	Deposition transcript of Seydou Ba, taken on November 30, 2021 (Attorney’s Eyes Only, highlighting added)
4	Deposition transcript of Kai Oeffner, taken on November 30, 2021 (Attorney’s Eyes Only, highlighting added)
5	Deposition transcript of Dinkar Piratla, taken on December 8, 2021 (Attorney’s Eyes Only, highlighting added)
6	Deposition transcript of Tricia Dugan, taken on December 9, 2021 (Attorney’s Eyes Only, highlighting added)
7	Deposition transcript of Anthony Simon, taken on December 15, 2021 (Attorney’s Eyes Only, highlighting added)
8	Deposition transcript of John Cafarella, taken on December 17, 2021 (highlighting added)
INTERROGATORY RESPONSES	
9	Defendant Apple’s Objections and Responses to Red Rock’s Interrogatories Nos. 1-5 Regarding Defendants’ Motion to Transfer, dated October 4, 2021 (Outside Attorneys Eyes Only)
10	Defendant Qualcomm, Inc.’s Responses and Objections to Red Rock’s Interrogatories Nos. 1-5 Regarding Defendants’ Motion to Transfer, dated October 4, 2021
11	Defendant Apple’s First Supplemental and Amended Objections and Responses to Red Rock’s Interrogatories Nos. 1-2 and 4 Regarding Defendants’ Motion to Transfer, dated October 27, 2021 (Outside Attorneys Eyes Only)
12	Qualcomm Inc.’s First Supplemental Responses and Objections to Plaintiff Red Rock’s Interrogatories to Qualcomm Nos. 1-2 Regarding Defendants’ Motion to Transfer, dated November 1, 2021 (Attorneys’ Eyes Only)
13	Qualcomm Inc.’s First Supplemental Responses and Objections to Plaintiff Red Rock’s Interrogatories to Qualcomm Nos. 3-4 Regarding Defendants’ Motion to Transfer and Appendix A, dated November 11, 2021 (Attorneys’ Eyes Only)

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Ex. No.	DESCRIPTION
14	Defendant Apple’s Second Supplemental and Amended Objections and Responses to Red Rock’s Interrogatory No. 4 Regarding Defendants’ Motion to Transfer, dated November 11, 2021 (Outside Attorneys Eyes Only)
15	Qualcomm Inc.’s Second Supplemental Responses and Objections to Plaintiff Red Rock’s Interrogatories to Qualcomm No. 3 Regarding Defendants’ Motion to Transfer, dated November 12, 2021 (Attorneys’ Eyes Only)
16	Qualcomm Inc.’s Third Supplemental Responses and Objections to Plaintiff Red Rock’s Interrogatories to Qualcomm No. 3 Regarding Defendant’s Motion to Transfer and Appendices A-B, dated December 3, 2021 (Attorneys’ Eyes Only)
17	Qualcomm Inc.’s Second Supplemental Responses and Objections to Plaintiff Red Rock’s Interrogatories to Qualcomm No. 4 Regarding Defendants’ Motion to Transfer, dated December 15, 2021 (Attorneys’ Eyes Only)
18	Qualcomm Incorporated’s First Supplemental Responses and Objections to Plaintiff Red Rock’s Interrogatories to Qualcomm No. 2 Regarding Defendants’ Motion to Transfer, dated December 20, 2021 (Attorneys’ Eyes Only)
19	Qualcomm Incorporated’s Fourth Supplemental Responses and Objections to Plaintiff Red Rock’s Interrogatories to Qualcomm No. 3 Regarding Defendants’ Motion to Transfer, dated December 20, 2021 (Attorneys’ Eyes Only)
20	Qualcomm Incorporated’s Fifth Supplemental Responses and Objections to Plaintiff Red Rock’s Interrogatories to Qualcomm No. 3 Regarding Defendants’ Motion to Transfer and Amended Appendix B and Appendices C-D, dated December 22, 2021 (Attorneys’ Eyes Only)
REQUESTS FOR PRODUCTION RESPONSES	
21	Defendant Apple’s Objections and Response to Red Rock’s Requests for Production Nos. 1-10 Regarding Defendants’ Motion to Transfer, dated October 4, 2021
22	Qualcomm, Inc.’s Responses and Objections to Plaintiff Red Rock’s Requests for Production Nos. 1-10 to Qualcomm Regarding Defendants’ Motion to Transfer, dated October 4, 2021
DEFENDANTS’ DECLARATIONS	
23	Second Declaration of Mark Rollins, executed December 14, 2021
24	Second Declaration of Anthony Simon in Support of Defendant Qualcomm

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EX. No.	DESCRIPTION
	Incorporated’s Motion to Transfer Venue to the Northern District of California and Exhibit A, executed December 17, 2021 (Attorneys’ Eyes Only)
25	Third Declaration of Anthony Simon in Support of Defendant Qualcomm Incorporated’s Motion to Transfer Venue to the Northern District of California, executed January 5, 2021 (Attorneys’ Eyes Only)
LINKEDIN PAGES	
26	Apple - Amy Mahan
27	Apple – Angelika Schneider
28	Apple – Anuj Dharia
29	Apple – David Standefer
30	Apple – Fikret Dulger
31	Apple – Glen Lochte
32	Apple – Howard Konetzke III
33	Apple – Jason Durnin
34	Apple – Jason Wakefield
35	Apple – John Marcincavage
36	Apple – Kai Oeffner, CMA
37	Apple – Lai Jin
38	Apple – Marcelo Ponce
39	Apple – Mary Anna Baldino
40	Apple – Nida Saiyed
41	Apple – Paul Fontaine
42	Apple – Paul Salas
43	Apple – Scott Foster
44	Apple – Seydou Ba
45	Qualcomm – Abdellatif Bellaouar
46	Qualcomm – Dinkar Piratla
47	Qualcomm – Ken Noblitt
48	Qualcomm –Matt Severson
49	Qualcomm – Sherif Embabi
50	Qualcomm – Teja Renukaradhya
51	Qualcomm – Tim Short
52	Qualcomm – Tom Leach
53	Qualcomm – Tricia Dugan
TECHNICAL DOCUMENTS	
54	U.S Patent No. 10,326,420 to Bellaouar et al.

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Ex. No.	DESCRIPTION
55	U.S. Patent No. 10,944,437 to Bellaouar et al.
56	S.T. Lee et al., A 1.5V 28mA Fully-Integrated Fast-Locking Quad-Band GSM-GPRS Transmitter with Digital Auto-Calibration in 130nm CMOS, 2004
57	U.S. Patent No. 7,376,400 to Bellaouar et al.
58	Oliver Werther et al., A Fully Integrated 14 Band, 3.1 to 10.6 GHz 0.13 um SiGe BiCMOS UWB RF Transceiver, December 2008
59	Sher Jiun Fang et al., A 28GHz Sliding-IF Receiver in 22nm FDSOI, downloaded May 26, 2020
60	Bertan Bakkaloglu et al., A 1.5-V Multi-Mode Quad-Band RF Receiver for GSM/EDGE/CDMA2K in 90-nm Digital CMOS Process, May 2006
61	Ranjit Gharpurey et al., A Direct-Conversion Receiver for the 3G WCDMA Standard, March 2003
62	Efficient Digital Baseband Predistortion for Modern Wireless Handsets, A Thesis Presented to The Academic Faculty by Seydou Nourou Ba, December 2009
63	U.S. Patent No. 8,150,335 to Waheed et al.
64	Khurram Waheed et al., Adaptive Digital Linearization of a DRP based EDGE Transmitter for Cellular Handsets, 2007
65	Sher Jiun Fang et al., A 90nm CMOS Receiver Front-End for GSM/GPRS/EDGE, 2006
OTHER EXHIBITS	
66	Memorandum Order, <i>Red Rock Analytics, LLC v. Samsung Electronics Co., Ltd. et al.</i> , Case No. 2:17-cv-00101-RWS-RSP, Dkt. No. 219, February 6, 2019
67	Red Rock’s Preliminary Infringement Contentions, <i>Red Rock Analytics, LLC v. Apple Inc., Qualcomm, Inc.</i> ; Case No. 6:21-cv-00346-ADA, served July 1, 2021
68	First Amended Exhibit A to Red Rock’s Preliminary Infringement Contentions, <i>Red Rock Analytics, LLC v. Apple Inc., Qualcomm, Inc.</i> ; Case No. 6:21-cv-00346-ADA, served October 4, 2021
69	First Amended Exhibit B to Red Rock’s Preliminary Infringement Contentions, <i>Red Rock Analytics, LLC v. Apple Inc., Qualcomm, Inc.</i> ; Case No. 6:21-cv-00346-ADA, served October 4, 2021
70	Exhibit C to Red Rock’s Preliminary Infringement Contentions, <i>Red Rock Analytics, LLC v. Apple Inc., Qualcomm, Inc.</i> ; Case No. 6:21-cv-00346-ADA, served July 1, 2021
71	Exhibit D to Red Rock’s Preliminary Infringement Contentions, <i>Red Rock</i>

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Ex. No.	DESCRIPTION
	<i>Analytics, LLC v. Apple Inc., Qualcomm, Inc.</i> ; Case No. 6:21-cv-00346-ADA, served July 1, 2021
72	Transcript of Discovery Hearing held before the Honorable Alan D. Albright, <i>Red Rock Analytics, LLC v. Apple Inc., Qualcomm, Inc.</i> ; Case No. 6:21-cv-00346-ADA, November 18, 2021
73	Spreadsheet produced by Qualcomm, Bates numbered QCRRAMTT346 00000022 (Attorneys’ Eyes Only)
74	Spreadsheet produced by Apple, Bates numbered APL-RR-II_00000806 (Attorneys’ Eyes Only)
75	Document titled “ [REDACTED] ” produced by Apple, Bates numbered APL-RR II 00000255 (Attorneys’ Eyes Only)
76	Email string involving Regan Rundio [law clerk to the Hon. Alan D. Albright] and counsel for Red Rock, Apple and Qualcomm regarding a discovery dispute, dated between November 18 and December 8, 2021
77	Tweet from the verified account of Juho Sarvikas, Qualcomm’s President of North America, dated May 17, 2021

CONFIDENTIAL – ATTORNEYS’ EYES ONLY**I. Introduction****A. This Case Centers on Persons, Documents, and Activities in and near WDTX**

Red Rock’s technical and damages experts, Messrs. Murias and Weinstein, have identified twenty-nine relevant party witnesses in Texas, almost triple the number Defendants say are in NDCA:

Party	Willing Witnesses		
	In or near WDTX	In NDCA	In SDCA
	(Count)		
1. Apple	19	5	1
2. Qualcomm	10	5	3
3. Red Rock	0	0	0
4. Third-Party	0	0	1
5. Total	29	10	5

Weinstein ¶80. Mr. Weinstein shows that the total economic cost of any inconvenience to these witnesses (\$23,726 in WDTX versus \$45,872 in NDCA) disfavors transfer. *Id.* ¶91. Additionally, Defendants have [REDACTED] relevant teams in Texas, with thousands of members, responsible for [REDACTED]. *Id.* ¶81-82. Accused products are designed and developed by Qualcomm in [REDACTED]. Murias ¶¶83-98. Red Rock’s 47,985-page document production all came from a server in Houston, Texas. Harris ¶7.

Accused Qualcomm hardware components are manufactured [REDACTED], with more than [REDACTED] of Qualcomm’s US semiconductor manufacturing for accused 5G and Wi-Fi 6 products occurring there. *Id.* ¶¶30-43. These [REDACTED] employees are relevant third-party witnesses with knowledge of infringement and are subject to this Court’s compulsory process. This too disfavors transfer.

The average time to trial is over seven months longer in NDCA than WDTX. Weinstein ¶¶95-97. Defendants’ Motion presented a misleading set of data that, when corrected for accuracy, shows an even greater discrepancy of 11 to 15 months of delay in NDCA. Harris ¶¶14-18. In fact, since 2018, the Waco division has held eleven patent trials, and the entire NDCA has held only three. Weinstein ¶¶95-97. Using a conservative damages estimate for this case, Mr. Weinstein used an accepted methodology from one of his prior economic studies concerning the cost of trial delay and calculated the economic opportunity costs to the parties associated with even a seven-month trial delay exceeds [REDACTED]. *Id.* ¶102.

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In all, five factors point towards WDTX and away from NDCA, and three are neutral.

B. Defendants Present an Incomplete and Inaccurate Record

The district judge acts as the factfinder and is given deference to determine whether a movant’s “clearly more convenient” burden has been met. *In re Vistaprint Ltd.*, 628 F.3d 1342, 1344 (Fed. Cir. 2010); *see also Chester v. Thaler*, 666 F.3d 340, 348 (5th Cir. 2011) (“As factfinder, the trial court is entitled to deference in credibility determinations”). As in most patent cases, Defendants have superior access to information about their operations. Given the limited scope of § 1404 discovery, the non-movant can never obtain the same level of access. This creates a situation where the fox is guarding the henhouse, giving Defendants the opportunity to present an inaccurate picture of their Texas operations by selectively omitting information or by giving unwarranted weight to operations in NDCA.

This is where credibility comes in. A movant who does not present a complete and accurate record is not credible and cannot carry its burden. *Rockstar Consortium LP v. Google Inc.*, 2014 WL 6480772, at *2 (E.D. Tex. Nov. 18, 2014) (noting “multiple instances” that “called into question the veracity and completeness of [defendant’s] evidence ... [defendant] has not, and cannot, meet its burden”); *Weatherford Tech. Holdings, LLC v. Tesco Corp.*, No. 2:17-CV-00456-JRG, Dkt. 53 at 6 (E.D. Tex. May 22, 2018) (noting the problems created by “self-serving declarations”).

Defendants’ view of the world is incomplete and insufficient to meet their burden. *First*, Defendants omit inconvenient information. They never mention that [REDACTED]

[REDACTED]

[REDACTED] or that Qualcomm’s [REDACTED]

Defendants only acknowledged these Texas operations after Red Rock’s motions to compel. A party that fails to mention inconvenient truths has not been candid and cannot meet its burden. *Pers. Audio, LLC v. CBS Corp.*, 2014 U.S. Dist. LEXIS 37089, at *8-9 (E.D. Tex. Mar. 20, 2014) (denying transfer where the movant “omitted highly relevant information in its briefing when that information did not support transfer”); *see also Abstrax, Inc. v. Hewlett-Packard Co.*, 2014 WL 5677834, at *3 (E.D. Tex. Nov. 4, 2014) (“An incomplete recitation of [the] facts may be just as misleading as an inaccurate recitation.”).

Second, Defendants take an unduly narrow view of this case, blinding themselves (and by extension,

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Red Rock and the Court) to relevant Texas activities. Their declarations and discovery responses use carefully chosen words to obfuscate their Texas operations. For example, Qualcomm’s declarants limited their investigation to “*algorithms and techniques* relating to any calibration of I-Q imbalance.” Dkt. 45-15 ¶¶8, 9, 11-13, 16-23; Dkt. 45-16 ¶¶6, 7, 9-11, 14-21 (all emphases added). Qualcomm chose these words to avoid any investigation of people who develop *hardware* that performs I-Q calibration, because [REDACTED] Qualcomm avoided investigating hardware even though Red Rock’s contentions accuse multiple hardware components (such as amplifiers, mixers, processors, channel gain adjusters, and signal paths). *See generally* Ex. 71.

When responding to Red Rock’s discovery, Defendants continued their myopic approach, stating that their discovery responses were expressly limited to “the *smallest team* responsible for the work related to ... the *algorithms and techniques* related to calibration of I-Q imbalance.” Ex. 10 at 6 (Qualcomm); *see also* Ex. 9 at 7 (Apple limiting response to “*the smallest group unit*”). Defendants also liberally deployed the qualifier “unique” when omitting relevant witnesses and documents in Texas. Dkt. 45-17 ¶11 (“I am not aware of any Apple employee who has *unique* information relevant to this case” in WDTX); Ex. 14 at 13 (“Apple does not have *unique* working files or documents ... in the WDTX.”).

The Court ordered Defendants to “provide an affidavit establishing that none of the identified... employees have direct knowledge about the I-Q calibration technology in the chips identified in Red Rock’s infringement contentions, or direct knowledge about *other accused functionality*...” Ex. 76. But rather than investigating “other accused functionality” (which would have required Qualcomm to disclose people who work on accused hardware), Qualcomm instead “investigated whether the surveyed employees have direct knowledge of (i.e., responsibility for) *algorithms and techniques* relating to calibration of I-Q imbalance.” Ex. 25 ¶8. Despite limiting their investigation, t [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

II. Argument – The Public and Private Factors Weigh Against Transfer

This suit could have been brought in either forum. The parties agree that private interest factor 4 and

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public interest factors 3 and 4 are neutral. Mot. at 13, 15. The remaining factors disfavor transfer.

A. Private Interest Factors

1. The Relative Ease of Access to Sources of Proof

As a practical matter, the “cost of electronic collection, review, and production does not vary based on where the electronic documents reside” and “those costs are minimal when compared with other litigation costs.” Weinstein ¶24.¹ Notwithstanding, this factor is still relevant and it weighs against transfer, because many relevant documents belonging to Red Rock, Apple, Qualcomm, and [REDACTED] are in Texas, and Apple [REDACTED] records are managed by the [REDACTED] Team in [REDACTED]. Defendants do not deny they have relevant documents in Texas, but they elected not to investigate those documents. Other than Qualcomm’s [REDACTED], neither Defendant has identified any particular relevant documents in California. And Qualcomm has not shown its alleged California documents are in NDCA (as opposed to SDCA where Qualcomm is headquartered) because it did not investigate this issue.

Every document (47,985 pages) produced by Red Rock was retrieved from a Houston, TX server maintained by Heim, Payne and Chorush, where they have resided for several years before this lawsuit due to the prior *Samsung* and *Apple* litigations involving the same patent.² Harris ¶¶4-7. Some of these are prior filings and transcripts marked AEO, meaning only HPC is authorized to have them. *Id.* Copies of the remaining documents are also maintained at Red Rock’s offices in Florida. Ex. 8 at 53:17-19.

Apple has relevant documents in Texas. Mr. Murias identified five Apple technical witnesses in Texas and a [REDACTED] Team in Austin [REDACTED]. Murias ¶¶44-82, 138. Party witnesses are considered under factor 3, but their location in Texas is also relevant here because these witnesses create and maintain in Texas documents pertaining to infringement and the technical value of the ’313

¹ [REDACTED]. Ex. 2 at 162:18-163:8; 218:4-24. Qualcomm did not investigate whether its servers are accessible in WDTX. Ex. 1 at 124:10-125:8.

² Documents transferred to a district to manipulate venue must be disregarded. *In re Hoffmann-La Roche Inc.*, 587 F.3d 1333, 1337 (Fed. Cir. 2009). But when documents are legitimately housed in connection with a prior lawsuit, such documents are properly afforded weight. *TracBeam, LLC v. Apple, Inc.*, 2015 WL 5786449, at *3 (E.D. Tex. Sept. 29, 2015) (“TracBeam has shown that the Eastern District of Texas holds ... documents that are housed in its counsel’s office as a result of its two prior cases...”); *see also Paltalk Holdings, Inc. v. Sony Computer Entm’t Am. Inc.*, 2010 WL 3517196, at *5-6 (E.D. Tex. Sept. 3, 2010); *Web Telephony, LLC v. Comcast Corp.*, 2010 WL 3860305, at *5 (E.D. Tex. Sept. 30, 2010).

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Patent by virtue of their knowledge and job responsibilities. *Id.*

Mr. Weinstein identified fourteen Apple witness in Texas and [REDACTED] Apple teams in Austin. Weinstein ¶¶28-34, 58-71. These people and teams create and maintain documents relevant to damages (revenues, sales, marketing, licensing) in Texas. *Id.* Importantly, the financial records in Apple’s [REDACTED] [REDACTED] are created, maintained, and accessed [REDACTED] *Id.* ¶¶27-28. [REDACTED] Ex. 2 at 32:13. Quarterly revenue associated with accused products, such as iPhones, can be accessed [REDACTED] *Id.* ¶27 (citing Ex. 2 at 22:14-23:1; 23:16-22). Apple’s [REDACTED] team in [REDACTED] “maintains” the [REDACTED]. Ex. 2 at 31:2-19. [REDACTED] members upload and retrieve financial information to and from [REDACTED]. Ex. 2 at 28:21-30:19. An [REDACTED] employee named [REDACTED] is responsible for [REDACTED]. Ex. 4 at 18:18-19:12. [REDACTED] servers are in [REDACTED], but the fact that [REDACTED] custodians are located in [REDACTED] is highly relevant to this factor. *In re Google LLC*, 2021 U.S. App. LEXIS 33789, at *7 (Fed. Cir. Nov. 15, 2021) (“[C]ourt erred by analyzing only the location of servers where documents are stored, rather than also considering the location of document custodians and location where documents are created and maintained.”).

Apple’s declarant stated “documents concerning testing or integration of the Qualcomm 5G transceivers in the Apple Accused Products reside on local computers and/or servers located in the NDCA.” Dkt. 45-17 ¶7. Yet he conceded “*Qualcomm does not provide Apple with the source code or other documentation* that describes how the I-Q gain imbalance calibration works in the Qualcomm 5G transceivers.” *Id.* ¶6. He also conceded at his deposition that Apple has no relevant technical documents about Qualcomm chips and he does not know whether “testing or integration” documents are relevant: “I don’t know whether or not they would be relevant or not... the accused functionality resides – it’s on the Qualcomm 5G transceiver, which means *all of the relevant information* associated with how Qualcomm’s 5G transceiver works and I-Q gain imbalance calibration, *it would come from Qualcomm.*” Ex. 2 at 199:24-200:11. Nor could he identify any relevant technical documents in NDCA. *Id.* at 193:21-194:9; 197:15-198:11. *In re HP Inc.*, 826 F. App’x 899, 903 (Fed. Cir. 2020) (“it is reasonable to reject vague and unsupported statements regarding the location of potential witnesses or sources of proof”).

When speaking about non-technical documents, such as financials, Apple never actually says those

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documents are in NDCA. Instead, Apple’s declarant stated that non-technical documents “reside on local computers and/or servers either located in or around the NDCA *or accessible in the NDCA*.” Dkt. 45-17 at ¶11; *see also* Ex. 2 at 216:20-217:24 (“It *could be* in a data center that’s located in northern California, or *it could be saved in a different location*.”). This careful hedging is unpersuasive.

Apple’s interrogatory response lists NDCA servers, but Apple does not say what those servers store, and Apple’s response states that servers are included in the list “even if they are not ‘Relevant Apple Databases.’” Ex. 14 at 15-16. Apple’s declarant could not answer simple questions about these databases:

Q. Other than [REDACTED] do you know what sort of information is stored on any of the databases in Pages 15 and 16?

THE WITNESS: Again, because I don't know exactly how these teams use these other databases, I don't know specifically what data would be stored here relevant to the groups that are listed within the Supplemental Response to Interrogatory Number 4 other than [REDACTED] since I use [REDACTED] regularly.

Q. Did you try to investigate whether any of the databases on Pages 15 and 16 contained technical information about the accused Apple products?

THE WITNESS: I'm trying to go through the list to see if I am aware of any of these stored technical information. None of them come to mind. I don't know either way. I did not do that specific investigation.

Ex. 2 at 160:11-162:16 (objections omitted).

Apple’s declarant also stated that “Apple does not have *unique* working files or documents relevant to this case located in the WDTX.” Dkt. 45-17 ¶¶7, 11. This is an implicit admission that Apple has “working files or documents relevant to this case located in the WDTX.” This admission is apparent from the declarant’s deposition testimony: “And so my word, ‘unique,’ in this sentence is that there could be a document that maybe resides in the Western District of Texas.” Ex 2 at 201:9-12 and 219:18-23. Apple’s declarant further admitted that he did not bother to inquire whether any relevant technical documents are in Texas: “I didn’t specifically ask whether ... any copies of the documents that they create or the teams create are located in the Western District of Texas.” Ex. 2 at 202:6-12.

Qualcomm also has relevant documents in Texas. Mr. Murias identified [REDACTED] Qualcomm technical witnesses in Texas and [REDACTED] relevant teams who [REDACTED]. Murias ¶¶83-137. These people and teams create and maintain in Texas documents pertaining to infringement and the value and contributions of the ’313 Patent. *Id.* Three Qualcomm witnesses in Texas are relevant to damages

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and likely create and maintain relevant documents regarding damages. Weinstein ¶¶39, 73-77.

Qualcomm’s declarants state that its technical documents “relating to any calibration of I-Q imbalance” are “generated by employees [REDACTED]

[REDACTED] Dkt. 45-15 ¶23; Dkt. 45-16 ¶21. But Qualcomm did not conduct a meaningful investigation:

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Ex. 1 at 97:12-101:7. Qualcomm also says its “finance group” is [REDACTED]

[REDACTED] Dkt. 45-15 ¶14; Dkt. 45-16 ¶12. But there was no real investigation:

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Ex. 1 at 119:22-121:23. Qualcomm’s response to Red Rock’s interrogatory No. 4 identifies [REDACTED], while stating “Qualcomm does not concede or admit to relevance... of the repositories and their stored information.” Ex. 17 at 12-14. None of these databases have [REDACTED]. The only relevant Qualcomm evidence Red Rock can say for sure is in California is Qualcomm’s [REDACTED]. Murias ¶20.

As discussed further below, [REDACTED] has a massive fabrication facility [REDACTED] that manufactures more than [REDACTED]% of Qualcomm’s [REDACTED] for the accused products, including certain accused hardware features. *Id.* ¶41. Given [REDACTED] direct involvement in this manufacture, [REDACTED] would necessarily have technical documents that describe these features bearing on infringement. *Id.* ¶43.

2. The Availability of Compulsory Process to Secure the Attendance of Witnesses

This factor weighs against transfer. [REDACTED] witnesses in WDTX are more likely to testify at trial than the two persons Defendants identified. And even if one [REDACTED] witness and both of Defendants’ witnesses testified, Mr. Weinstein’s analysis (¶46) shows the trial attendance cost for them is lower in WDTX:

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Third Party Witness	Cost of Attendance in the WDTX	Cost of Attendance in the NDCA
Rishi Mohindra	\$984	\$572
Tong Zhang	\$984	\$572
█████ Austin Employee	\$286	\$1,168
Average Cost of Attendance	\$751	\$771

Defendants identify two allegedly relevant third-party witnesses in NDCA, Rishi Mohindra and Tong Zhang. Mot. at 10. Dr. Mohindra is an inventor on a prior art reference. Defendants have not said they will call him, and such witnesses are “rarely called to trial.” *AGIS Software Dev. LLC v. Huawei Device USA Inc.*, 2018 WL 2329752, at *5 (E.D. Tex. May 23, 2018); Weinstein ¶45. Red Rock will not call Dr. Mohindra. Harris ¶19. Dr. Zhang co-authored an academic paper cited in Red Rock’s contentions. Red Rock will not call Dr. Zhang as a witness and will instead rely on source code and other evidence to prove infringement. *Id.* ¶20. Nor have Defendants said that they plan to call Dr. Zhang.³

█████ facility is a source of relevant third-party witnesses. ██████████
 ██████████. Murias ¶¶41-42. Mr. Murias analyzed Qualcomm’s source code for these ██████ and identified multiple elements of the claimed ██████████
 ██████████
 ██████████

██████████ in claims 7 and 22). Murias ¶19-29, 41. ██████ employees likely have relevant knowledge of such “claimed features, how those features are laid out on the chip, and how they are connected.” Murias ¶42. Red Rock has not taken discovery of ██████, so cannot identify its employees by name, but this is not required. *In re HP Inc.*, 826 F. App’x 899, 903 (Fed. Cir. 2020) (“There was thus no basis to discount these [third-party] entities just because individual employees were not identified.”).

3. The Cost of Attendance for Willing Witnesses

This factor disfavors transfer. Apple identifies five NDCA witnesses, but three are technical persons

³ Defendants have not argued that they would be inconvenienced by presenting these witnesses’ deposition testimony at trial. *In re Apple Inc.*, 374 F. App’x 997, 998 (Fed. Cir. 2010) (upholding denial of transfer and observing that “the availability of video depositions of non-party witnesses” may mitigate inconvenience); see also *VirtualAgility, Inc. v. Salesforce.com, Inc.*, No. 2:13-CV-00011-JRG, 2014 WL 459719, at *5 (E.D. Tex. Jan. 31, 2014).

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with admittedly (as shown above) no relevant knowledge. Thus, Apple identifies at most two relevant Apple NDCA witnesses. Qualcomm identified eleven NDCA witnesses, but six are people who merely authored documents cited in contentions that no party will call at trial. There are at most five relevant Qualcomm witnesses in NDCA. Red Rock has one SDCA witness, one in Florida, and Red Rock’s experts have identified twenty-nine relevant party WDTX witnesses. Mr. Weinstein explains that typical trials have about three or four fact witnesses per side. Weinstein ¶84. Because there are far more witnesses in WDTX than in NDCA, it stands to reason that more witnesses will come from WDTX, resulting in a lower cost of trial in WDTX. But even assuming equal numbers of witnesses from WDTX, NDCA, and SDCA, the cost of trial attendance is still lower in WDTX (\$2,201) than NDCA (\$2,736). *Id.* ¶¶88-90.

Even assuming every person Defendants identify in their declarations is relevant, Defendants have identified sixteen people in NDCA and ten people in SDCA, as compared with Red Rock’s twenty-nine identified witnesses in WDTX. “[A] district court acts reasonably when it refuses to weigh the willing witness factor in favor of transfer if unable to determine from the movant’s presentation of the factor that there are more potential witnesses in the transferee venue than the plaintiff’s chosen forum.” *In re Overhead Door Corp.*, No. 2022-100, 2021 U.S. App. LEXIS 35980, at *5 (Fed. Cir. Dec. 7, 2021). It is unrealistic to think all of these witnesses will come to trial, but Mr. Weinstein calculates that if they did, it would be significantly cheaper in WDTX (\$23,726) than NDCA (\$45,872). Weinstein ¶91.

Apple’s declarant identifies six Apple witnesses. Dkt. 45-17. Five are in NDCA, and one is in SDCA. Three are technical witnesses involved, for example, in “integrating Qualcomm 5G transceivers.” *Id.* ¶¶8–10. But as shown above, the declarant conceded that Apple employees have zero relevant knowledge when it comes to Qualcomm chips because “*all of the relevant information* associated with how Qualcomm’s 5G transceiver works and I-Q gain imbalance calibration ... *come[s] from Qualcomm.*” Ex. 2 at 200:7-11. Nor did Apple meaningfully investigate whether it has Texas employees with technical knowledge. *See id.* at 98:17-20 [REDACTED]

[REDACTED]; *id.* at 93:1-11 [REDACTED]

[REDACTED] Ex. 2 at 98:6-99:19; 115:1.

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[REDACTED] Ex. 3 at 13:15-17; 14:14-16; Ex. 2 at 99:21-101:15. Red Rock’s contentions accuse all Apple products “that include a 5G wireless transceiver.” Ex. 68 at 1. [REDACTED]

[REDACTED] Murias ¶¶47-57.

Importantly, [REDACTED] these Apple employees in [REDACTED] have knowledge about the value and technical contributions of the ’313 Patent invention. In the previous *Samsung* case, “[t]o determine the value of the ’313 patent’s technology, Weinstein relie[d] on [the technical expert’s] findings regarding the **’313 patent’s effect on error vector magnitude (‘EVM’)**.” Ex. 66 at 1-2 (order denying a *Daubert* challenge against this methodology). EVM is a measure of transceiver error that “provides a way to numerically quantify benefits obtained by the accused infringer by practicing the ’313 Patent, including improvements in transmission speed and throughput performance in the accused transceivers.” Murias ¶17. The 5G and Wi-Fi 6 standards specify EVM requirements. *Id.* ¶15. Apple’s [REDACTED] employees will understand the importance of I-Q calibration for EVM improvement and 5G standard compliance.

For example, Austin employee Seydou Ba is a member of the Apple [REDACTED] Team and his patents and publications discuss I-Q gain imbalance calibration and EVM improvement techniques. Murias ¶58-65. Dr. Ba’s Ph.D. thesis provides a mathematical definition of EVM. *Id.* ¶62 (citing Ex. 62). His thesis acknowledges “quadrature (***I/Q***) ***gain*** and phase ***imbalances***” as problematic and describes a way of calibrating I-Q gain imbalance. *Id.* This calibration technique includes a transmitter-to-receiver loopback signal path, direct conversion mixers, and channel gain adjusters, among other features relevant to the ’313 patent. *Id.* Dr. Ba’s thesis further includes simulations that show an initial 8.0% I-Q gain imbalance, which limits EVM to -24.9dB and is insufficient to comply with either the 5G or Wi-Fi 6 standards, but his calibration improved EVM to standard-compliant levels. *Id.* ¶63. Dr. Ba has knowledge about how I-Q calibration improves EVM and why it is important for standard compliance. [REDACTED]

[REDACTED] Murias ¶58-59.

Mr. Murias provides a detailed technical analysis of five specific relevant Apple technical witnesses in Austin and concludes that all of these people have knowledge relevant to infringement and the value

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of the patented features, including: I-Q gain imbalance calibration (Ba, Schneider, Marcincavage); the effect of I-Q gain imbalance on EVM measurements and transceiver performance (Ba, Dulger, Fontaine); the claimed “signal path for injecting” (Ba, Schneider, Marcincavage); the claimed “direct conversion subsystem” (all); and the claimed “processor” (Fontaine, Marcincavage). *Id.* ¶¶58-82.

Mr. Weinstein similarly concluded, in his detailed analysis, that fourteen Apple witnesses in Austin have knowledge relevant to damages topics including: accused product revenues and unit sales (Foster, Lochte, Oeffner, Salas, Jin, Baldino, Ponce); IP licensing policies and comparable licenses (Dharia, Wakefield); accused product marketing and customer demand for accused features (Mahan, Konetzke, Oeffner, Durnin, Standefer); and sales forecasting (Saiyed). Weinstein ¶¶56-71. Mr. Weinstein also identifies the specific *Georgia-Pacific* factors that each witness is knowledgeable about. Additionally, Mr. Weinstein identified [REDACTED] relevant Apple teams in Austin that are relevant to damages. *Id.* ¶¶28-34. The [REDACTED] Team is responsible for [REDACTED]. *Id.* ¶¶27-31. The [REDACTED] and [REDACTED] Teams are responsible for [REDACTED]. *Id.* ¶32-34.

Qualcomm’s two declarants purport to identify eight witnesses with relevant knowledge (five in NDCA and three in SDCA). Dkt. 45-15 ¶¶8, 11; Dkt. 45-16 ¶¶6, 9. The declarants also identify twelve Qualcomm employees whose names appear on public documents cited in Red Rock’s contentions (six in NDCA and in six SDCA). Dkt. 45-15 ¶25; Dkt. 45-16 ¶23. Qualcomm does not say these latter twelve witnesses are relevant. Red Rock stipulates it will not call these twelve people as witnesses; Red Rock will prove its infringement case through source code and other evidence. Harris ¶21.

Qualcomm has at least seven relevant technical witnesses, all located in either WDTX or nearby Richardson. Murias ¶¶99-137. Mr. Murias also identified a relevant [REDACTED] and a relevant [REDACTED]. *Id.* ¶¶84-98. Red Rock’s complaint and contentions explicitly accuse the digital signal processor on the Qualcomm chips as an infringing feature. Ex. 71 at 36-37, 39-40, 46 (identifying the “DSP” as satisfying the “processor” limitations). In the accused products, [REDACTED]

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[REDACTED] Murias ¶¶87-88.

Qualcomm’s declarant stated the [REDACTED]

[REDACTED] Dkt. 45-15 at ¶18. And it misses the point—that [REDACTED]

[REDACTED] Murias ¶¶87-89. Not surprisingly, when [REDACTED]

[REDACTED] Ex. 24 ¶¶9, 13. Qualcomm later claimed “those responses were in

error,” stating these people have [REDACTED]

[REDACTED] *Id.* ¶13; Ex. 25 ¶8. But Qualcomm also admitted these two people work on

[REDACTED] *Id.* The [REDACTED]

[REDACTED] identified in Red Rock’s infringement contentions. Murias ¶130. Mr. Murias concludes that [REDACTED]

[REDACTED] *Id.* ¶¶126-137.

Qualcomm’s [REDACTED] is also relevant. Qualcomm admits that the [REDACTED] works on [REDACTED] for the accused products. Ex. 25 ¶18. Qualcomm did not investigate what [REDACTED] is designed by the [REDACTED]. Ex. 1 at 125:9-127:20. But Ron Murias did investigate. He reviewed Qualcomm’s [REDACTED] and found that the [REDACTED] contain a number of specifically accused features (listed *supra* at I.B.). Murias ¶¶25-29. Accordingly, members of the [REDACTED] have knowledge relating to [REDACTED] for the accused products. *Id.* ¶¶92-114.

Qualcomm employees in or near WDTX also have knowledge of EVM, including the 5G and Wi-Fi 6 standard’s EVM requirements that speak to the value of the ’313 Patented invention. [REDACTED]

[REDACTED] of Richardson, TX [REDACTED]

Ex. 24 ¶9. Her online bio says she works on “RF Cal[ibration]” and has a “[s]trong understanding of

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3GPP specifications [i.e., the 5G standard].” Murias ¶121. Qualcomm’s declarant stated that she [REDACTED] Ex. 25 ¶8.

Throughput is directly related to EVM and “I-Q calibration directly impacts transceiver throughput.” Murias ¶124. Similarly, Qualcomm Texas employees [REDACTED] also have deep technical knowledge of these topics, as Mr. Murias shows. *Id.* ¶¶104-111, 115-125.

Three Qualcomm witnesses in or near WDTX have knowledge relevant to damages. Weinstein ¶¶73-77. Qualcomm admits two of them are relevant: [REDACTED] Ex. 24

¶19. A Qualcomm executive tweeted: “Tricia Dugan is joining us at #teamqualcomm as the **Vice President of Strategic Accounts**. With Tricia’s experience, we look forward to **driving Snapdragon & 5G** together with our partners to new heights.” Ex. 77. Similarly, Tom Leach is “Senior Manager, Business Development” who manages “all sales efforts with National Accounts to grow [5G] market share.” Weinstein ¶76. Mr. Weinstein explains these witnesses are relevant to damages topics and also identifies the specific *Georgia-Pacific* factors that each witness is knowledgeable about. *Id.* ¶73-77.

John Cafarella, Red Rock’s only member and the ’313 Patent’s inventor, is a willing witness who lives in Florida. Ex. 8 at 8:22-24. It is more convenient for him to attend trial in WDTX than NDCA given the shorter distance to Texas and his attorneys presence here. *Id.* at 131:15-132:10. Red Rock will call Dr. Cafarella at trial. Harris ¶22. Jeffrey Fischer, a Red Rock consultant, is a willing witness who lives in San Diego, CA. Fischer ¶¶2-3. As stated in his declaration, it is more convenient for him to attend trial in WDTX than NDCA. *Id.* ¶¶5-7. Red Rock will call Mr. Fischer at trial. Harris ¶23.

Mr. Weinstein performed an economic analysis to determine the cost of witness travel and attendance at trial. Weinstein ¶¶85-19. For SDCA witnesses, he finds that the cost of trial attendance is similar in WDTX (\$931) and NDCA (\$996). *Id.* ¶88. This result is consistent with the Federal Circuit’s guidance. *In re Pandora Media, LLC*, No. 2021-172, 2021 U.S. App. LEXIS 30963, at *15 (Fed. Cir. Oct. 13, 2021) (“We have rejected the rigid application of the 100-mile rule in cases in which the witnesses will be required to travel a significant distance no matter where they testify.”). Because SDCA witnesses will incur comparable costs in NDCA and WDTX, SDCA witnesses do not meaningfully impact this factor.

CONFIDENTIAL – ATTORNEYS’ EYES ONLY**B. Public Interest Factors****1. The Administrative Difficulties Flowing from Court Congestion**

Mr. Weinstein analyzed trial data to determine the extent of court congestion. His conclusions are stark—WDTX generally, and the Waco division specifically, are far less congested than NDCA. Since 2018, there have been eleven patent trials in Waco and just three patent trials in NDCA. Weinstein ¶¶95-96. For patent trials since 2018, the average time to trial in Waco is 7 months faster than in NDCA. Weinstein ¶¶95-97 (under 23 months in Waco and over 30 months in NDCA). Expanding the scope to all of WDTX and all civil matters filed from 2018-2021, the average time to trial in WDTX is 6.7 months faster than in NDCA. *Id.* at ¶104 (22.9 months in WDTX and 29.6 months in NDCA). Mr. Weinstein also considered patent cases pending as of March 16, 2020 (the start of COVID-19). He found that the average age of those pending cases is 31 months in Waco and 45 months in NDCA. *Id.* at ¶106.

Defendants argue this factor is “neutral” because their misleading data supposedly indicates the time to trial in NDCA and WDTX is “comparable.” Mot. at 13 and Ex. 11. Defendants’ data has three serious problems. *First*, it includes the *Regents* case, which was a **plant patent** case not subject to the **utility** patent local rules. N.D. Cal. P.L.R. 1-2. *Second*, the data uses the date of **transfer**, not the date of filing, for time to trial in *Opticurrent*. With these flaws corrected, Defendants’ dataset would show a median NDCA time to trial of **35.0 months** (not 17.3 months) and a mean of **32.5 months** versus a median WDTX time to trial of 24.0 months. Third, Defendants omitted the *Cyntec* case that went to trial one day before its motion was filed. When *Cyntec* is considered, the median NDCA time to trial is **38.9 months** and the mean is **35.1 months**. Properly constituted, Defendants’ dataset shows that WDTX is faster than NDCA by **11-15 months**. Harris ¶¶8-18 (showing calculations).

Mr. Weinstein analyzed the economic consequences of this delay. First, Mr. Weinstein used his prior royalty rate from the *Samsung* case and estimates of Apple’s iPhone sales to arrive at a conservative estimate of damages owed by Apple for only iPhones, which exceed [REDACTED]. Weinstein ¶102. Adding Qualcomm’s damages would likely double this number. Second, using an accepted methodology from one of his prior economic studies concerning judicial delay, he determined the economic opportunity cost to the parties attributable to a trial delay of seven months—a conservative estimate. In

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this case, considering only [REDACTED] the opportunity cost is at least [REDACTED]. *Id.* at ¶¶98-102 (about \$1M opportunity cost for each \$10M in controversy). Third, Mr. Weinstein considered the AIPLA’s 2021 survey, which estimates that costs for patent infringement cases with more than \$25 million in controversy are approximately \$10 million higher in NDCA than Texas. *Id.* at ¶107.

This analysis shows that court congestion strongly disfavors transfer, which would result in negative economic impacts on all parties. It also is important that the costs associated with seven months of delay (many millions of dollars), greatly exceed the costs associated with the other factors, such as travel.

2. The Local Interest in Having Localized Interests Decided at Home

This factor concerns the “significant connections between a particular venue and the events that gave rise to a suit.” *In re Juniper Networks, Inc.*, No. 2021-160, 2021 U.S. App. LEXIS 29036, at *12-13 (Fed. Cir. Sep. 24, 2021). The facts that gave rise to this suit are closely tied to WDTX. The majority of identified party witnesses who designed and developed the accused features are located in WDTX, including the [REDACTED]. The employees in Defendants’ massive Austin campuses are also engaged in [REDACTED] accused products in WDTX. Likewise, [REDACTED] manufactures hardware for the accused products [REDACTED]. [REDACTED] Murias ¶41. Defendants receive [REDACTED] Weinstein ¶¶112-14. Tax breaks are not given heavy weight, so they do not change this factor. *In re Apple Inc.*, 979 F.3d 1332, 1345 (Fed. Cir. 2020).

This factor disfavors transfer. The specific facts of this case have less connection to NDCA than WDTX. To be sure, Defendants also have campuses and operations in NDCA. But Apple claims it does not know how the accused products perform I-Q calibration, and Apple has identified no California witnesses with knowledge of accused features. The majority of witnesses who [REDACTED] [REDACTED] are in WDTX, with only a handful in NDCA, and the rest in SDCA. Even their Motion hedges: “development of the Accused Functionality related to the Accused Qualcomm Products occurs in NDCA *or San Diego*.” Mot. at 14.

III. Conclusion

Defendants have not shown that the Northern District of California is “clearly more convenient.”

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DATED: January 14, 2022

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that all counsel of record are being served with a copy of the foregoing document via the Court's CM/ECF system per Local Civil Rule CV-5 on January 14, 2022.

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**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION**

RED ROCK ANALYTICS LLC,
Plaintiff,

v.

APPLE INC., QUALCOMM
INCORPORATED
Defendants.

Case No. 6:21-cv-00346-ADA

**JURY TRIAL DEMANDED
FILED UNDER SEAL**

**DEFENDANTS QUALCOMM INCORPORATED AND APPLE INC.'S
SEALED REPLY IN SUPPORT OF THEIR MOTION TO
TRANSFER VENUE TO THE NORTHERN DISTRICT OF CALIFORNIA**

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B	Nov. 22, 2021 Discovery Hearing Transcript
C	Sept. 14, 2018 Expert Report of R. Weinstein
D	Red Rock's July 1, 2021 Infringement Contentions
E	Feb. 10, 2022 Deposition Transcript of Ron Murias
F	Sept. 14, 2018 Expert Report of Christopher Jones
G	Exhibit 23 to the Dec. 15, 2021 Deposition of Anthony Simon (Qualcomm's Responses to Depo. Questions 1–14)
H	QCRRAMTT346_0000023
I	Oct. 13, 2020 Announcement of Apple iPhone 12
J	Sealed Order, <i>Red Rock Analytics, LLC v. Samsung Elecs. Co. Ltd.</i> , No. 2:17-cv-00101-RSP, Dkt. 282 (E.D. Tex. Apr. 17, 2019)
K	Feb. 25, 2022 Declaration of Mary Anna Baldino
L	Mar. 3, 2022 Confidential Declaration of Paul Fontaine
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T	Mar. 3, 2022 Declaration of Marcelo Ponce
U	Mar. 1, 2022 Declaration of Nida Saiyed
V	Feb. 25, 2022 Declaration of Paul Salas
W	Feb. 25, 2022 Declaration of David Standefer
X	Mar. 2, 2022 Declaration of Jason Wakefield
Y	Dec. 8, 2021 email from R. Rundio Re: Discovery dispute in Red Rock v. Apple/Qualcomm (Case No. 6:21-CV-00346)
Z	Intentionally omitted
AA	March 4, 2022 Declaration Of Ryan Lee In Support Of Defendant Qualcomm Incorporated's Reply Brief In Support Motion To Transfer Venue To The Northern District Of California
BB	March 3, 2022 Declaration Of Timothy Short In Support Of Reply Brief In Support Of Defendants' Motion To Transfer Venue To The Northern District Of California
CC	Google Flights results for flights from Fort Lauderdale, Florida to San Francisco, California on Monday, May 2, 2022, accessed on March 4, 2022
DD	Google Flights results for flights from Fort Lauderdale, Florida to Waco, Texas on Monday, May 2, 2022, accessed on March 4, 2022
EE	Google Maps driving time results from Austin-Bergstrom International Airport to Waco, Texas, accessed on March 4, 2022
FF	Google Maps driving time results from Dallas/Fort Worth International Airport to Waco, Texas, accessed on March 4, 2022

GG	Google Flights results for flights from San Diego, California to Houston, Texas on Monday, May 2, 2022, accessed on March 4, 2022
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RRA engaged in exhaustive, burdensome, and unnecessary discovery of Qualcomm and Apple for the transfer analysis, and with each additional demand uncovered more evidence confirming that most of the relevant witnesses and evidence are in NDCA and the rest are in nearby San Diego. That NDCA is home to the majority of relevant witnesses should not be a source of surprise given that Apple is headquartered in NDCA and Qualcomm’s employees responsible for [REDACTED] are in NDCA.

To attempt to identify a link to Texas, RRA engaged in a narrow process recently rejected by this Court in *Monterey Research, LLC v. Broadcom Corp.*, No. W-21-CV-00542-ADA, 2022 WL 526242, at *7-8 (W.D. Tex. Feb. 21, 2022). RRA admittedly confined its search to asking “are there relevant witnesses in Texas?” rather than “where are the relevant witnesses?” *Id.* Making matters worse, RRA hired “experts” (Ron Murias and Roy Weinstein) to review LinkedIn profiles for only Texas-based employees and speculate about what those people “likely” know, where relevant evidence is “likely” stored, how many witnesses might be called at trial, or what the NDCA schedule might be. *See generally* Dkt. 73-1 and Dkt. 73-2. Weinstein confirmed that he does not know if the people whom he and Murias identified have relevant knowledge, testifying he “can’t be certain” whether witnesses know how Qualcomm’s accused products work. *See, e.g.*, Ex. A (Feb. 17, 2022 Dep. of R. Weinstein (“Weinstein Dep.”)) at 185:8–18. RRA cites no legal authority giving weight to self-serving, speculative “expert” contentions in the transfer analysis—particularly where the “experts” have no expertise regarding either Qualcomm and Apple employees or the *Volkswagen* factors. *In re Volkswagen of Am., Inc.*, 545 F.3d 304 (5th Cir. 2008).

Further, comparing RRA’s opposition arguments to the actual facts shows that RRA and its transfer “experts” are wrong. The employees whom Murias and Weinstein claim will have

relevant information ([REDACTED]
 [REDACTED]) work and reside outside of Texas,
 and mostly in NDCA or elsewhere in California.

The only legitimate, credible evidence demonstrates that *no* Qualcomm and Apple witnesses with direct relevant knowledge are located in WDTX or elsewhere in Texas, no other relevant Qualcomm and Apple evidence is located in Texas, and none of the Texas-based Qualcomm and Apple departments and individuals identified by RRA are relevant, likely witnesses. RRA's arguments and speculation are contrary to multiple sworn declarations from witnesses with direct knowledge, three 30(b)(6) witnesses' testimony, and Defendants' interrogatory responses that confirm the relevant witnesses and evidence are in California—especially NDCA. For these reasons and those set forth in Defendants' opening brief, the convenience of witnesses, compulsory process, ease of access to proof, and local interest factors all weigh heavily in favor of transfer and the remaining factors are neutral.

I. THE COURT SHOULD GIVE NO WEIGHT TO RRA'S EXPERTS

There are four reasons that the Court should give no weight to (and otherwise exclude) the declarations of Weinstein and Murias under Federal Rules of Evidence 702 and 704.

First, as a threshold issue, the entirety of Weinstein's and Murias's declarations should be disregarded for purposes of transfer because both are unqualified. They are not qualified to opine on the *Volkswagen* factors because they are not lawyers. *See Smith v. City of Bastrop*, No. 1:19-CV-1054-RP, 2021 WL 148061, at *6 (W.D. Tex. Jan. 15, 2021) (striking an expert report for "legal opinion on how the law should be interpreted and applied in this case, which are questions for the Court"). And they are not qualified to opine on whether an individual has relevant knowledge because they are not experts in evaluating LinkedIn pages and publications to divine the scope of a person's knowledge and job responsibilities (to the extent anyone could be such an

expert). “[A]llowing an expert to give his opinion on the legal conclusions to be drawn from the evidence both invades the court’s province and is irrelevant.” *Owen v. Kerr-McGee Corp.*, 698 F.2d 236, 240 (5th Cir. 1983).

Weinstein is an economist and a statistician. *See* Dkt. 73-2 ¶ 5; Weinstein Dep. at 17:22-18:4, 191:3-9. Weinstein has no expertise in engineering, manufacturing, or financial database management for Apple or Qualcomm. Weinstein Dep. at 28:20-22, 188:9-16. He also has no knowledge regarding how the departments, groups, and teams are organized at Qualcomm, let alone what they know and do. *Id.* at 30:4-31:18. He does not have any expertise [REDACTED]

[REDACTED]. *Id.* 36:17-37:24. As such, he has no basis to provide “expert opinion” regarding how the Defendants create and maintain technical and financial data. Moreover, Weinstein has no legal expertise—he has never been a judge, an attorney, or a paralegal. *Id.* at 18:5–12, 24:9–13. In hundreds of cases, Weinstein has never opined on the *Volkswagen* factors. *Id.* at 20:1-22, 24:4-8, 25:8-11, 27:8-6, 28:4-16. Weinstein also has no specialized expertise on the cost of attendance for witnesses. Therefore, Weinstein lacks any specialized “knowledge, skill, experience, training, or education” that would qualify him to opine on any of the *Volkswagen* factors. *See Wilson v. Woods*, 163 F.3d 935, 937-38 (5th Cir. 1999) (excluding expert whose experience and professional training “was no greater than that of any other individual with a general scientific background”).

Similarly, Murias only opines about what Defendants’ and third parties’ employees *might* know and what documentation they *might* have, but he has also no specialized “knowledge, skill, experience, training, or education” that would qualify him to opine on the particular duties, communications, strategic decisions, and organization structure within Qualcomm, Apple, and

employees “are likely to have relevant information about the accused products.” Dkt. 73-1 ¶¶ 31, 36–38, 42–43. But in reaching this conclusion Murias ignores that the claims have nothing to do [REDACTED] (Dkt. 74-9 at 17–18; Murias Dep. at 115:16–23, 117:17–118:9, and 129:15–21) and further requires Murias to invent claims about Qualcomm coordinating with [REDACTED] [REDACTED] Murias Dep. at 122:15–123:1, 123:20–126:11, 128:12–23; *see also* Section II.B, *infra*.

Both experts identify Qualcomm and Apple employees who are confirmed—via sworn declaration and deposition testimony from those with personal knowledge or who spoke to those with personal knowledge—to have no knowledge relevant to the accused technology in this case. Compare, e.g., Dkt. 74-13 ¶¶ 8-12, 19, Ex. A; Dkt. 73-10 at 10:16–21, 29:14–21 (██████████ Dep.) with Dkt. 73-2 ¶¶ 73–75, Weinstein Dep. at 71:18–74:7, 185:19-187:2 (speculating ██████████ relevant in declaration despite disregarding contrary evidence); Dkt. 74-13 ¶¶ 8-12 (Second Simon Decl.), Ex. A; Dkt. 73-9 at 18:12–19:5, 45:13–24 (██████████ Dep.) with Dkt. 73-1 ¶¶ 115-119, Murias

Dep. at 181:6–183:11 (same for [REDACTED]); Dkt. 74-13 ¶¶ 4-13, Ex. A; Dkt. 74-14 ¶¶ 8, 9 (Third Simon Decl.) with Dkt. 73-1 ¶¶ 126–137, Murias Dep. at 186:5–195:2 (same for [REDACTED]); Dkt. 74-13 ¶¶ 4-13, Ex. A; Dkt. 74-14 ¶¶ 8, 9 with Dkt. 73-1 ¶¶ 126–137, Murias Dep. at 173:12–25 (same for [REDACTED]); Dkt. 73-7 at 16:17–17:11 with Dkt. 73-1 ¶¶ 56–65, Murias Dep. at 227:5–232:6 (same for [REDACTED] *see generally* Dkt. 45-15; Dkt. 45-16, Dkt. 74-12 through 74-14.

Third, Weinstein’s and Murias’s declarations are not based on reliable principles and methods.

Paragraphs 43-45, 51-52, 56-79, 81-84, and 92 of Weinstein’s declaration and paragraphs 30-86 and 89-138 of Murias’s declaration regarding relevance and knowledge of employees should be disregarded for the purposes of § 1404 as improper *ipse dixit*. *See Edmonds v. Illinois Central Gulf Railroad Co.*, 910 F.2d 1284, 1287 (5th Cir. 1990) (“Without more than credentials and a subjective opinion, an expert’s testimony that ‘it is so’ is not admissible.”). Both employ the same flawed approach: identify certain individuals in Texas (without any methodology for doing so) and, under the guise of some unidentified expertise, leap directly to conclusions on relevance and likely knowledge, without analyzing any contrary evidence on the record. *See, e.g.*, Dkt. 73-1, ¶¶ 74–78; Dkt. 73-2, ¶¶ 52–77. For example, Murias could not recall and otherwise refused to explain how he chose specific employees for his declaration or how he could divine information in people’s heads from the LinkedIn information he considered. Murias Dep. at 84:20–92:23, 86:12–87:4. Similarly, Weinstein’s “methodology” is no more than speculation based on LinkedIn profiles limited to Texas. *See* Weinstein Dep. at 49:2–50:12, 34:21–36:2.

Paragraphs 30-86 and 89-138 of Murias’s declaration and paragraphs 23–28, 31–47, and 49–94 of Weinstein’s declaration of should be disregarded because they result from unreliable

speculation based on “personal knowledge and experiences” alone instead of the facts of the case. *See Moore v. Ashland Chem. Inc.*, 151 F.3d 269, 275 (5th Cir. 1998) (“‘knowledge’ connotes more than subjective belief or unsupported speculation”).

All of Weinstein’s *Volkswagen* analysis results from unreliable, personal speculation. With regard to private factor 1 (access to sources of proof), Weinstein discounts facts in favor of his personal views on the storage of evidence. *See, e.g.*, Dkt. 73-2, ¶¶ 23, 24, 38, 39. Weinstein’s opinions on private factors 2 and 3 (availability of compulsory process and inconvenience to willing witnesses) impart his personal experience in unrelated trials to speculate and predict what witnesses and strategy the parties will employ in this case. *See, e.g., id.* ¶¶ 43, 45 47, 84; Weinstein Dep. at 109:4–110:18. And Weinstein’s rationale for travel costs speculates extensively using his personal travel habits. *See e.g., id.* at 112:7–113:2, 116:9–20, 119:24–121:19) But despite acknowledging that “each case is different,” Weinstein does not attempt to explain why his past experiences alone are sufficient, nor does he connect these experiences (and ultimate opinions) to the specific circumstances here. Opinions stemming from these personal experiences are no more than “unsupported speculation or subjective belief.” *See Johnson v. Arkema, Inc.*, 685 F.3d 452, 459 (5th Cir. 2012).

Similarly, Murias—who opines on the operations and knowledge of Qualcomm, Apple, [REDACTED] employees—speculates about the roles of individuals, teams, and offices at Qualcomm to generate a narrative that fits his conclusions. Murias Dep. at 63:12–64:12, 135:5–140:13, 149:5–150:18, 157:3–25 (speculating which employees designed particular hardware, write software code, and have knowledge of accused products).

Paragraphs 98-103 of Weinstein’s declaration should be disregarded because his analysis of the hypothetical cost due to the potential delay to trial is also flawed. In particular, Weinstein

derives his hypothetical damages by using his rate from the *Samsung* litigation, without using any *Georgia Pacific* factors that reflect **this** litigation. *See, e.g.*, Weinstein Dep. at 127:25-128:12, 148:14-149:2, 155:18-22, 157:23-158:2 (not considering hypothetical negotiation in this case); 162:8-163:8 (not comparing current accused products to licenses and accused products in *Samsung* litigation). Such a rate equates to an inadmissible rule of thumb. *See Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1315 (Fed. Cir. 2011) (“the patentee must sufficiently [tie the expert testimony on damages] to the facts of the case” (internal quotation marks omitted, alteration original)). Weinstein compounds this error by applying an arbitrary rate of return that fails to consider any actual facts about Red Rock’s investment tendencies, taxes and debts owed, and inflation. *See, e.g.*, Weinstein Dep. at 140:1-6, 142:15-143:24.

Fourth, the entirety of Weinstein’s and Murias’s declarations should be disregarded as mere mouthpieces for attorney argument. Because the *Volkswagen* test is based on fact (and not expert) evidence, many of Weinstein’s and Murias’s opinions are simply attorney argument masquerading as expert opinion and should be excluded. *See Ask Chemicals, LP v. Computer Packages, Inc.*, 593 F. App’x 506, 510–11 (6th Cir. 2014) (“Where an expert merely offers his client’s opinion as his own, that opinion may be excluded.”). Weinstein and Murias directly assume the role of advocate. Murias uses several paragraphs to offer attorney argument to rebut statements made about Defendants’ employees. *See, e.g.*, Dkt. 73-1, ¶¶ 111, 124, 125, 130, 136 (questioning language and veracity of Qualcomm’s declarations). And Weinstein injects nearly all his *Volkswagen* opinions with attorney argument. *See, e.g.*, Dkt. 73-2, ¶¶ 38, 39 (arguing for the weight given to the physical location of evidence); ¶¶ 90, 92 (discounting the importance of travel costs relative to litigation costs regardless of venue); ¶¶ 104–06 (arguing the significance of

various time-to-trial differences). These opinions exceed the purview of expert testimony and should be excluded. *See Smith*, 2021 WL 148061, at *6; Fed. R. Evid. 704.

II. THE PRIVATE INTEREST FACTORS FAVOR TRANSFER

A. The Convenience Of Willing Witnesses Strongly Favors Transfer

The location of relevant witnesses supports transfer. RRA admits that its witnesses are in Florida (John Cafarella) and the San Diego area (Jeffrey Fischer), but not in Texas. Dkt. 73 at 9. As discussed below, the relevant Apple or Qualcomm witnesses are likewise not in Texas.

1. RRA improperly relies on speculation to identify Texas witnesses and fails to apply the correct inquiry for identifying relevant likely witnesses

RRA only speculates that Texas employees could have information. Speculation is not enough. *See In re Atlassian Corp. PLC*, No. 2021-177, 2021 WL 5292268, at *3 (Fed. Cir. Nov. 15, 2021) (rejecting relevance arguments as based on conjecture and as contrary to the record); *In re Netflix, Inc.*, 2022-110, 2022 WL 167470, at *4 (Fed. Cir. Jan. 19, 2022) (identifying EDTX employees who merely “appear[] just as likely” to have information less compelling than declarations identifying NDCA employees who designed, developed, and managed accused technology and authored articles cited in complaint). RRA cannot identify anyone with direct knowledge of the accused I-Q gain calibration functionality because Defendants’ extensive investigations confirm that no such witnesses are in Texas.¹ Dkt. 45-15 ¶¶ 15-22 (First Simon Decl.); Dkt. 45-16 ¶¶ 13-20 (Vijayan Decl.); Dkt. 74-13 ¶¶ 4-13, Ex. A; Dkt. 74-14 ¶¶ 7-9; Dkt. 45-17 (Decl. of M. Rollins) ¶¶ 5-10; Dkt. 73-12 (Second Decl. of M. Rollins) ¶¶ 2-6. Those

¹ Well before RRA’s response brief, each of the Qualcomm employees who RRA and its experts attempt to claim are likely witnesses were affirmed to not have direct knowledge of the accused I-Q calibration technology for the accused products pursuant to the Court’s direction. Dkt. 74-13 ¶¶ 4-13, Ex. A; Dkt. 74-14. RRA also deposed two of them ([REDACTED]) and sought and was received for several more (including [REDACTED]) before its brief yet RRA and its “experts” wholly discard the contrary evidence. Dkt. 74-14; Dkt. 73-9; Dkt. 73-10.

investigations also confirm that no relevant [REDACTED] personnel are in Texas. Dkt. 45-15 ¶ 14; Dkt. 45-16 ¶ 12; Dkt. 74-12 ¶¶ 4-12, Ex. A; Dkt. 45-17 ¶¶ 11-16. Notably, *all* the Qualcomm employees identified by name by RRA have confirmed that they have no direct knowledge of [REDACTED]. Dkt. 74-13 ¶¶ 4-13, Ex. A; Dkt. 74-14. Apple’s 30(b)(6) witness likewise confirmed [REDACTED]
[REDACTED]
[REDACTED] Dkt. 74-12 ¶¶ 4-6.

For example, for Qualcomm sales witnesses, RRA identified Tricia Dugan, Ken Noblitt, and Tom Leach based on their LinkedIn profiles and Weinstein’s speculation that they might know something useful. Weinstein Dep. at 90:23–91:3; *In re Google LLC*, No. 2021-178, 2021 WL 5292267, at *2 (Fed. Cir. Nov. 15, 2021) (agreeing that online profiles were entitled to little weight). RRA and Weinstein’s identification of Tom Leach as a “likely” witness underscores the unreliability of LinkedIn for this purpose. Tom Leach left Qualcomm in 2009—over a decade before the accused products were announced. Ex. JJ; *see also* Dkt. 74-13 ¶ 16. This and RRA’s other erroneous conclusions make clear that RRA’s and its expert’s research was designed to conjure up relevant witnesses throughout Texas, as opposed to looking for evidence of who and where the relevant witnesses might be located.² *Monterey Research*, 2022 WL 526242, at *7.

As to technical issues, the idea that RRA will rely on *any* individual witness testimony to prove its case is belied by RRA’s litigation history. In both this case and in RRA’s prior case against Samsung, RRA’s technical expert, Murias, analyzed infringement based solely on technical documents without considering any witness testimony. *See* Dkt. 73-1, ¶¶ 5, 19, 20, 25–

² The other Qualcomm sales people identified by RRA and its expert are also not likely witnesses, as discussed in Section II.A.2.b, *infra*.

29, and Appendix A; Murias Dep. at 37:15–39:10, 44:14–45:1, 77:2–25, 79:25–80:4, 147:19–148:8. To map the claims to the accused products in this case, Murias simply “went into the code room and found what I needed to find. It’s that simple.” Murias Dep. at 38:18–39:10. Similarly, RRA’s testifying expert in the Samsung case (in which Qualcomm products were accused) cited testimony from only a *single* [REDACTED] witness: [REDACTED]. See Ex. F (Sept. 14, 2018 Expert Report of C. Jones) ¶ 399 and its Ex. A at ¶ 5. Qualcomm will offer testimony from one or more 30(b)(6) witnesses on technical issues here and, [REDACTED] [REDACTED] [REDACTED], those witnesses will reside in NDCA and SDCA.

Even assuming that RRA intends to break with its own practice and rely on fact witness testimony here, RRA has not sufficiently identified a single relevant Texas-based Qualcomm or Apple witness. From the outset, RRA applied the incorrect inquiry. Murias, for example, was asked by RRA’s counsel “to look at Texas and that’s what [he] did.” Murias Dep. at 82:25–83:22. He did not “investigate whether there are any Qualcomm or Apple employees outside the State of Texas that would be likely sources of relevant evidence about infringement”³ (Murias Dep. at 83:5–13; 85:22–86:11) and did not investigate whether the California-based employees identified by Qualcomm have information relevant to this case (Murias Dep. at 83:5-13, 133:23–134:7; 144:5–146:3, 175:20–176:9). Similarly, Weinstein did not seek to identify any Qualcomm or Apple witnesses in California who might have relevant information. Weinstein Dep. at 52:24–55:5. Such a gerrymandered search for witnesses violates this Court’s guidance that “the opening

³ Murias later testified that he “looked at people outside of Texas,” but could not remember how many or what their names were. Murias Dep. at 158:13–159:22.

inquiry” for a venue investigation “should be ‘where are the relevant witnesses located?’; not ‘are there relevant witnesses located in [Texas]?’” *Monterey Research*, 2022 WL 526242, at *7.

2. Qualcomm’s Witnesses Are in NDCA and SDCA, Not Texas

a. Qualcomm identified likely NDCA witnesses based on actual knowledge of who designed and developed the accused technology and transceivers

As already acknowledged by RRA and noted by the Court, the accused functionality in this case is “IQ calibration.” Ex. B at 29:16–30:10. RRA’s own damages expert described the patented technology as “teach[ing] how to calibrate for what are known as I/Q gain imbalances in wireless transceivers” in his report cited in his declaration in this case. Ex. C (Sept. 14, 2018 Expert Report of R. Weinstein) ¶ 29; Weinstein Dep. at 151:2–21. Following an extensive pre-motion investigation based on interviews of those with actual knowledge of who does what within Qualcomm (confirmed via further investigation during discovery), Qualcomm identified six people who have direct knowledge [REDACTED].⁴ Dkt. 45-15 ¶ 11; Dkt. 45-16 ¶ 9. All are in NDCA or San Diego. RRA does not dispute that the identified witnesses have direct relevant knowledge and are likely witnesses. Unlike RRA, Qualcomm identified relevant witnesses by asking “where are the relevant witnesses?” rather than “are there relevant witnesses in Texas?” *See Monterey Research*, 2022 WL 526242, at *7.

RRA attempts to retreat from its allegations that papers and patents by six NDCA and six SDCA authors are relevant. Dkt. 73 at 11; *E.g.*, Dkt. 31-2 (First Amended Compl.) at 9, 10, 14, 15; Ex. D (Red Rock’s July 1, 2021 Infringement Contentions) at 7, 8, 12, 13. But those papers and patents constitute nearly all the evidence cited in RRA’s complaint and infringement

⁴ RRA tries to ascribe meaning to Qualcomm’s use of terms like “algorithms and techniques” and “responsibilities” (Dkt. 73 at 3, 12), but those terms are plainly meant to demonstrate that it investigated who at Qualcomm [REDACTED].

contentions, and no evidence cited in RRA's complaint or contentions has any apparent relationship to Texas-based Qualcomm employees. *Id.* Just because RRA abandons its complaint and contentions evidence does not mean that Qualcomm will not call those authors to rebut RRA's contentions.

b. The Qualcomm witnesses RRA identified are not likely to testify

For sales witnesses identified by RRA and its expert, Tom Leach undeniably has no relevant information and is not a likely witness for the reasons previously discussed in Section II.A.1, *supra*. The remaining two sales witnesses identified by RRA are also not likely witnesses. Tricia Dugan and Ken Noblitt confirmed that neither has relevant knowledge. Both affirmed that they have no knowledge of [REDACTED]. Dkt. 74-13 ¶¶ 4-12, 19,

Ex. A. In her deposition, Tricia Dugan further testified that [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Dkt. 73-10 at 8:24–10:24, 15:4-14, 16:7-19, 18:20-25, 21:9-22:15, 44:16-45:22; Weinstein Dep. at 58:1–19. [REDACTED]

[REDACTED]. Dkt. 74-13 ¶¶ 5–6, 19, Ex. A. Moreover, Weinstein admitted that he made no attempt to investigate the people identified by Qualcomm as relevant or conduct a similar LinkedIn search in NDCA or elsewhere (Weinstein Dep. at 52:24–53:15) and did not consider the [REDACTED]. Weinstein

Dep. at 81:2–84:7, 89:20–90:1 (citing Dkt. 72-10 at 21:6–24, 45:11–23, 48:3–49:22). In short, RRA and its expert searched only for people in WDTX rather than for relevant witnesses. *Monterey Research*, 2022 WL 526242, at *7.

For technical witnesses, RRA relies heavily on *unnamed* members of the [REDACTED] [REDACTED] in Texas as allegedly being potential witnesses. But RRA fails to inform the Court that records produced by Qualcomm indicate that at least [REDACTED] California-based employees work in those same departments and that scores more in NDCA and SDCA are also involved in the general design work relied on by RRA. Dkt. 75-19. Nor can RRA’s generic speculation overcome the sworn testimony confirming that Texas employees have no direct relevant knowledge. Dkt. 45-15 ¶¶ 15-22; Dkt. 45-16 ¶¶ 13-20; Dkt. 74-13, Ex. A; Dkt. 74-14. Such speculation is entitled to less weight in the context of § 1404. *See Atlassian*, 2021 WL 5292268, at *3; *Netflix*, 2022 WL 167470, at *4. Moreover, Murias testified that, other than the seven specific Qualcomm employees discussed in his declaration, he felt “comfortable bringing . . . forward” no one else. Murias Dep. at 87:6–88:1.

RRA’s theory of relevance for Qualcomm’s Texas-based employees is premised on speculation that these unnamed employees [REDACTED]. Dkt. 73 at 11–12. But the ’313 patent’s inventor confirmed that he did not invent the hardware components that RRA identifies in its opposition papers (*e.g.*, DSPs, receive chains, amplifiers). Dkt. 73-12 at 39:1–17; 67:20–73:8. Regarding the DSP, Murias alleges that only a single element of the asserted claims is satisfied by the DSP hardware: the generic structural element “processor.” Whether or not the accused products include a DSP is not a central dispute in this case. RRA’s allegations focus on several claimed functions—including functions claimed simply as being performed by the “processor”—that it claims are satisfied by *software code*. Dkt. 73-1 ¶ 88 (“The DSP (when executing code) performs functions,” including the “processor[’s]” function of “forming an observable indicator”); Murias Dep. at 67:13–68:5 (code running on the DSP allegedly [REDACTED]).

██████████”); *see also* Dkt. 73 at 11; Dkt. 73-4 ¶¶ 20–21. Qualcomm’s declarants Anthony Simon and Rajiv Vijayan have testified that ██████████

██████████ Neither RRA nor Murias rebuts that testimony. *See, e.g.*, Dkt. 45-15; Dkt. 45-16; Dkt. 74-13; Murias Dep. at 109:9–23, 150:12–18 ██████████

Regarding the ██████████ RRA and its expert do not identify any specific relevant hardware designed in Texas. That is not surprising, as Qualcomm’s declarants have affirmed that

██████████. Dkt. 45-16 ¶¶ 9–11; Dkt. 45-15 ¶¶ 11–13; Dkt. 74-13; Dkt. 74-14. Murias’s theory that ██████████

██████████)) ignores the Court’s guidance that the search for relevant witnesses should “focus on the people who . . . have direct information with regard to the accused functionality” (Ex. B at 29:16–30:7) and that mere awareness of that functionality is insufficient (*id.* at 31:4–12). *In re DISH Network L.L.C.*, No. 2021-182, 2021 WL 4911981, at *3 (Fed. Cir. Oct. 21, 2021) (“[E]ven if these Texas-based operations may have some connection to the accused [products], that connection is insubstantial compared to Colorado’s significant connection to the design and development of the accused features.”). Indeed, if mere awareness of portions of ██████████

██████████ were the test for identifying relevant or likely witnesses, the population of relevant witnesses might include hundreds or even thousands of Qualcomm employees in California alone.

RRA guesses that Sher Fang, Abdellatif Bellaouar, and Sherif Embabi might have information but fails to acknowledge that [REDACTED]. Dkt. 74-38; Dkt. 74-34; Dkt. 74-14. Other than non-specific references to RFIC design and generic RF technology in their work history and bare speculation about what these witnesses know or “would need to know” (*see, e.g.*, Dkt. 73-1 ¶ 99), RRA (through its expert declaration) builds its case for relevance on papers and patents that these employees wrote before joining Qualcomm and that have no apparent relation to any product accused in this case. Murias Dep. at 165:13–167:7 (“Sliding-IF” paper written while Bellaouar, Fang, and Embabi worked for Globalfoundries and relates to specific FDSOI technology with no known tie to case);⁵ 168:22–171:10 (patents are assigned to GlobalFoundries and Murias “didn’t say either . . . describes a Qualcomm product”); and 177:20–179:8 (“Quad-Band Receiver” paper written by Fang while working for Texas Instruments, relates to old cellular standards not at issue here and specific fabrication technology with no known tie to case). Murias cites those papers as evidence that Fang and Bellaouar are “knowledgeable about the SECS2 fabrication operations” (Dkt. 73-1 ¶¶ 103, 110) but, as discussed below, there is no evidence that the specific fabrication technology discussed in those papers is [REDACTED], and the ’313 patent has nothing to do with fabrication. For Fang, RRA specifically sought additional information about her during discovery and that additional information confirmed [REDACTED]. All three confirmed that [REDACTED]. [REDACTED] Dkt. 73 Ex. 25 at 2–3; Dkt. 74-13 ¶¶ 4-12, Ex. A; Dkt. 74-14 ¶ 8a.

⁵ Murias does not even know what “FDSOI” stands for. Murias Dep. at 167:2-7.

RRA's assertions for Teja Renukaradhya and Dinkar Piratla are also unfounded. [REDACTED]

[REDACTED]. Dkt. 73-9 at 18:12–19:5; 45:13–46:7; 62:6–64:2 (Dec. 8, 2021 Dep. of D. Piratla); Dkt. 74-14 ¶ 8e. They have no direct relevant knowledge, as the sworn declarations from Anthony Simon confirm. Dkt. 74-14 ¶¶ 4-13, Ex. A; Dkt. 74-14 ¶¶ 8-9. The technical underpinning of RRA and Murias' rationale regarding these employees is also flawed. Murias contends that because Piratla and Renukaradhya sometimes [REDACTED] they must work with [REDACTED]. Dkt. 73-1 ¶¶ 115, 117–19, 122–25; Murias Dep. at 181:6–13. But Murias admitted that [REDACTED] (Murias Dep. at 181:14–16, 184:3–185:5), and that he has no reason to doubt Piratla's sworn deposition testimony that [REDACTED] (*id.* at 182:1–183:11).

The only specific [REDACTED] identified by RRA are [REDACTED], but neither is involved in the design or development of any hardware or software at issue and neither has knowledge of the accused I-Q gain calibration functionality. Dkt. 74-13 ¶ 13; Dkt. 74-14 ¶¶ 8c-8d; Ex. BB. Despite the sworn testimony explaining what they and their team do, RRA and its expert simply declare that [REDACTED] must have relevant knowledge and that their job description must be different from what Qualcomm says it is. When asked to explain this speculation, Murias hypothesized that [REDACTED] Murias Dep. at 185:17–187:18; *see also id.* at 134:21–143:21. [REDACTED]

[REDACTED]

[REDACTED] RRA and its “experts” are wrong, which is not surprising as their understanding of what Qualcomm’s employees do or how products are developed at Qualcomm is based entirely on speculation and guesswork. Ex. BB ¶¶ 5-14

3. Apple’s Witnesses Reside in NDCA, Not Texas

Regarding the Apple employees, RRA admits that no Apple technical witnesses with knowledge of the accused chips work in WDTX. Dkt. 73 at 5, 8-9. Instead, all Apple witnesses

⁶ Murias admitted that [REDACTED]

responsible for [REDACTED]

[REDACTED] Dkt. 45-17 ¶¶ 8-9. As to the damages witnesses, RRA does not deny that [REDACTED]

[REDACTED]

[REDACTED]. Dkt. 73-6 (Rollins Dep.) at 63:10-64:15, 170:20-171:20. Nor does it deny that [REDACTED]

[REDACTED]. Dkt. 45-17 ¶ 14.

Rather than dispute these facts, RRA points to three categories of other alleged Apple witnesses. But none is remotely likely to testify, and RRA’s assertions to the contrary are based on speculation that is directly contrary to the facts.

First, RRA contends that that [REDACTED] has knowledge of [REDACTED] Dkt. 73 at 9-10. But, as Apple explained when RRA unsuccessfully sought to compel discovery on this topic, [REDACTED]

[REDACTED] Ex. B at 31:17-33:6; Dkt. 73-6 at 114:6-115:7. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Ex. Y. [REDACTED]

[REDACTED]

Second, RRA refers to five employees whom Murias identified as allegedly “likely” knowing about “infringement” and “the technical value contributions of the ’313 Patent.” Dkt. 73-1 ¶¶ 45-82; Dkt. 73 at 10-11. But to the extent that these employees have any knowledge about I-

Q calibration at all, it is decades old, unrelated to the 5G standard, and certainly not connected to the Qualcomm 5G chips or the accused products in this case.

As to Angelika Schneider, Fikret Dulger, Paul Fontaine, and John Marcincavage, Murias simply speculates about their “likely” knowledge based on (1) their LinkedIn profiles, and (2) patents and publications from 2003, 2006, and 2008—long before 5G even existed—on which they are one of many authors. Dkt. 73-1 ¶¶ 66-82 (citing Dkt. 75-3 (2008 patent); 75-4 (2008 paper); Dkt. 75-6 (2006 paper); Dkt. 75-7 (2003 paper)).

[REDACTED]

[REDACTED]

[REDACTED]. Ex. L (Fontaine Dec.) ¶ 2. [REDACTED]

[REDACTED] *Id.* ¶¶ 2-3.⁷ The 2008 patent, 2003 IEEE paper, and 2006 IEEE paper Murias cited [REDACTED]

[REDACTED]. *Id.* ¶ 5. [REDACTED]

[REDACTED]

[REDACTED]. *Id.* ¶¶ 3-4. [REDACTED]

[REDACTED] *Id.* ¶¶ 6-9.

[REDACTED] Ex. M (Marcincavage Dec.) ¶ 3. [REDACTED]

[REDACTED] *Id.* [REDACTED]

[REDACTED]. *Id.* ¶ 4.

[REDACTED]

⁷

[REDACTED] Ex. L ¶ 3.

[REDACTED]. *Id.* ¶ 2. [REDACTED]
[REDACTED]. *Id.* ¶ 3.
His contribution to the 2008 IEEE paper that Murias cited [REDACTED]
[REDACTED]. *Id.* ¶ 5.

The only deponent among the alleged technical witnesses Murias identifies, Seydou Ba, further confirms the unreliability of LinkedIn profiles and past papers to determine an individual's knowledge and the lengths to which RRA must stretch to identify allegedly relevant witnesses in Texas. While RRA claims that Dr. Ba has knowledge of I-Q calibration and EVM improvement techniques, [REDACTED]
[REDACTED]

[REDACTED] Dkt. 73-7 at 93:22-95:9, 67:19-68:2, 77:7-19. [REDACTED]
[REDACTED]. *Id.* at 17:1-6. [REDACTED]
[REDACTED] *Id.* 14:3-25.⁸

None of these employees is likely to testify regarding infringement or the value and technical contributions of the '313 patent, which (as this Court has explained) relates to I-Q calibration, because [REDACTED]
[REDACTED].

⁸

[REDACTED]
[REDACTED] Dkt. 73-7 at 17:22-18:6, 20:13-19, 23:12-24:14, 27:11-18, 29:7-13, 55:23-56:5, 75:17-25.
[REDACTED] *Id.* at 89:21-90:9.

Third, RRA’s expert, Weinstein, points to fourteen employees identified as allegedly “likely” knowing about damages topics. Dkt. 73-2 ¶¶ 56-71; Dkt. 73 at 11. But that is speculation based *only* on LinkedIn profiles, and is contradicted by the testimony of the only one of these employees RRA deposed: Kai Oeffner. [REDACTED]

[REDACTED] Dkt. 73-8 at 7:21-9:21. [REDACTED]

[REDACTED]. *Id.* at 11:10-12:12. [REDACTED]

[REDACTED] *Id.* at 12:13-13:17.

The other thirteen individuals whom RRA identifies have similarly limited and/or irrelevant knowledge. As to those RRA says have knowledge of accused product revenues and unit sales, Dkt. 73 at 11, [REDACTED]

[REDACTED] Ex. P (Foster Dec.) ¶ 2. [REDACTED]

[REDACTED] Ex. R (Lochte Dec.) ¶ 2. [REDACTED]. Ex. V (Salas Dec.) ¶ 2. [REDACTED]

[REDACTED] Ex. K (Baldino Dec.) ¶ 2. [REDACTED]

[REDACTED] Ex. T (Ponce Dec.) ¶ 2.⁹

[REDACTED] (Ex. P (Foster)

⁹

[REDACTED] Ex. V ¶ 3.

¶ 6, Ex. R (Lochte) ¶ 4, Ex. V (Salas) ¶ 5, Ex. K (Baldino) ¶¶ 4, 6, Ex. T (Ponce) ¶ 4); [REDACTED]

[REDACTED] (Ex. P (Foster) ¶¶ 3-4; Ex. R (Lochte) ¶ 4, Ex. V (Salas) ¶ 3, Ex. K (Baldino) ¶ 3, Ex. T (Ponce) ¶ 4); [REDACTED]

[REDACTED] (Ex. P (Foster) ¶ 5, Ex. R (Lochte) ¶ 5, Ex. V (Salas) ¶ 4, Ex. K (Baldino) ¶ 5, Ex. T (Ponce) ¶ 5). Weinstein is therefore in error that they have knowledge related to “convoyed sales,” “commercial success,” or the extent to which Apple has made use of the accused features.

As to those RRA says have knowledge of IP licensing policies and comparable licenses, Dkt. 73 at 11, [REDACTED]

[REDACTED] Ex. X (Wakefield Dec.) ¶ 2. [REDACTED]

[REDACTED]. *Id.* ¶ 5. [REDACTED]

[REDACTED] Ex. N (Dharia Dec.) ¶¶ 2-3. [REDACTED]

[REDACTED] (Wakefield ¶¶ 5-7, Dharia ¶¶ 4-6). Contrary to Weinstein’s assertion, neither is remotely likely to be a witness regarding relevant IP licensing policies or comparable licenses.

As to those RRA says have knowledge of accused product marketing and customer demand for accused features, Dkt. 73 at 11, [REDACTED]

[REDACTED]. Ex. S (Mahan Dec.) ¶ 2. [REDACTED]

[REDACTED]

[REDACTED] Ex. Q (Konetzke Dec.) ¶ 2. [REDACTED]

[REDACTED]

[REDACTED] Ex. O (Durnin Dec.) ¶¶ 2-3. [REDACTED]

[REDACTED]. Ex. W

(Standefer Dec.) ¶ 2.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] (Ex. S (Mahan) ¶ 3, Ex. Q (Konetzke) ¶ 3, Ex. O (Durnin) ¶ 5, Ex. W

(Standefer) ¶ 5), [REDACTED] (Ex. S (Mahan

¶¶ 4-5), Ex. Q (Konetzke) ¶ 4, Ex. O (Durnin) ¶ 6, Ex. W (Standefer) ¶ 4). They are not remotely

likely to be witnesses in this case.

Finally, RRA identifies Nida Saiyed as allegedly having knowledge related to sales forecasting. Dkt. 73 at 11. [REDACTED]

[REDACTED]. Ex. U (Saiyed

Dec.) ¶ 2. [REDACTED]

[REDACTED]

[REDACTED]

Id. ¶¶ 2, 3, 6-7. Weinstein is therefore wrong that she has knowledge related to “convoyed sales,”

“commercial success,” or the extent to which Apple has made use of the accused functionality.

Weinstein makes much of SAP being the “source of truth” for Apple’s financial data (Dkt. 73-2 ¶ 27), [REDACTED] (Ex. K (Baldino) ¶ 6, Ex. O (Durnin) ¶ 7, Ex. P (Foster) ¶ 6, Ex. Q (Konetzke) ¶ 5, Ex. S (Mahan) ¶ 6, Ex. U (Saiyed) ¶ 4, Ex. V (Salas) ¶ 5, Ex. W (Standefer) ¶ 5).

All of this is consistent with Rollins’s testimony that [REDACTED]
[REDACTED]
[REDACTED] Ex. 73-6 at 29:12-30:10, 167:13-169:22, 213:5-22. Even if these fourteen people RRA identifies each had a small “part of the picture needed” for a full damages analysis, Dkt. 73-2 ¶ 68, RRA cannot contend that it would be more convenient to call fourteen people from Texas for information that one person in NDCA can provide. That is the antithesis of “convenient.” *See* Ex. B at 29:16-30:7 (Court acknowledging that some knowledge of iPhone sales not enough to keep case in WDTX and focus should be on those with “direct information with regard to the accused functionality.”).

4. NDCA Is Equally Or More Convenient Than WDTX for RRA Witnesses

RRA concedes that its witnesses are not in Texas, but instead are in Florida and San Diego, California. While RRA offers testimony from Cafarella and a declaration from Fischer that Texas is more convenient for them than California, those assertions are disconnected from the reality of the travel burden and should be given little weight.

Cafarella resides in a condo in Lauderdale-by-the-Sea, Florida, which is also RRA’s “office.” Dkt. 73-12 (Cafarella Dep.) at 8:22-9:17, 24:19-25:15. Cafarella has never been to Waco. *Id.* at 133:8-9.¹⁰ The total travel time from Fort Lauderdale to either Waco or San Francisco is

¹⁰ He has “[p]ossibly once, but so long ago [he’s] not sure” been to Austin. Dkt. 73-12 at 133:10-13.

comparable. Ex. CC (showing 6 hr 20 min nonstop flight from Fort Lauderdale to San Francisco); Ex DD (showing 3 hr flights from Fort Lauderdale to Dallas or Austin); Ex. EE (showing 1 hr 37 min driving time from Austin to Waco); Ex. FF (showing 1 hr 48 min driving time from Dallas to Waco); *In re Quest Diagnostics Inc.*, 2021 WL 5230757, at *2 (Fed. Cir. Nov. 10, 2021) (alleged convenience of Waco for witnesses in Maryland and New Jersey could not outweigh convenience of CDCA for other witnesses because lack of airport in Waco meant total travel time would not be “significantly different.”)

Fisher is a consultant for RRA who lives in San Diego, California. Dkt. 73-3 ¶ 2. As an initial matter, as a consultant, Fisher’s convenience should not be given similar weight to that of a party witness. *Cf. Abstrax, Inc. v. Hewlett-Packard Co.*, No. 2:14-CV-158-JRG, 2014 WL 5677834, at *5 (E.D. Tex. Nov. 4, 2014) (“[T]he Court gives little weight to the locations of the parties’ expert witnesses.”). Even so, Fisher contends that it would be more convenient for him to attend trial in Waco than in the NDCA because “RRA’s attorneys are located in Houston, and their offices are only a few hours’ drive from Waco, Texas.” *Id.* ¶¶ 5-6. But to get to Houston from San Diego and then drive to Waco takes a total of six hours, whereas flying from San Diego to San Francisco takes just an hour and forty-five minutes. Ex. GG (showing 3 hr nonstop flights from San Diego to Houston); Ex. HH (showing 2 hr 51 min driving time from Houston to Waco); Ex. II (showing flights from San Diego to San Francisco). The only reasons he provides for why NDCA is less convenient are that “RRA’s attorneys are not in Northern California,” and that “[i]n my experience, hotels tend to be more expensive in Northern California than in Texas.” *Id.* ¶ 7. Any difference in the cost of the hotels is partially compensated for by the difference in the cost of the flights. Ex. GG (flights to Houston ~\$166); Ex. II (flights to San Francisco ~\$99). The

location of counsel is irrelevant. *See, e.g., In re Horseshoe Ent.*, 337 F.3d 429, 434 (5th Cir. 2003); *see also In re Google Inc.*, 588 F. App'x 988, 991 (Fed. Cir. 2014).

5. RRA Fails to Account for Time Costs

RRA also ignores the time cost of travel. *See In re Google LLC*, No. 2021-171, 2021 WL 4592280, at *5 (Fed. Cir. Oct. 6, 2021) (finding that time away from home in an important consideration); *In re Google LLC*, No. 2021-170, 2021 WL 4427899, at *4 (Fed. Cir. Sept. 27, 2021) (same); *In re Volkswagen AG*, 371 F.3d 201 (5th Cir. 2004) (“Additional distance means additional travel time; additional travel time increases the probability for meal and lodging expenses; and additional travel time with overnight stays increases the time which these fact witnesses must be away from their regular employment.”). The convenience driver in this case is the time cost for witnesses, which is far lower in NDCA given that vast majority of relevant, likely witnesses reside in or closer to NDCA. *Supra* §§ II.A.2-4; Dkt. 45 at 11-13. Any minor differences in *financial* costs are irrelevant and do not change that the factor weighs heavily in favor of transfer.

Regardless, RRA’s financial costs analysis is flawed. The Bay Area has several major airports and multiple direct flights from all major cities, including San Diego; Waco does not. Weinstein Dep. at 113:8-25; 125:15–22; 126:5–10. All of Defendants’ currently identified witnesses are in California, and the difference between local travel for the NDCA witnesses and a non-stop 90-minute flight from San Diego compared to the hours-long travel to Waco is significant. Dkt. 45-5 at 1 (flights from San Diego to San Jose); Ex. II (flights from San Diego to San Francisco); Weinstein Dep. at 125:15-126:9. Further, RRA’s skewed analysis of hotel costs is misleading and does not weigh against transfer. Dkt. 73-2, Ex. 3 (excluding hotels with “airport” in name; only searching some hotel brands; assuming only San Jose-area hotels).

B. Availability of Compulsory Process Strongly Favors Transfer

Because invalidity is an important defense in this case, Defendants will likely bring prior art witnesses to trial.¹¹ RRA's and its experts' speculation is of little import. *In re Juniper Networks, Inc.*, 14 F.4th 1313, 1319 (Fed. Cir. 2021). Because there are specifically identified third party witnesses who are only subject to the subpoena power of NDCA, the compulsory process factor weighs in favor of transfer. *See In re Hulu, LLC*, 2021 WL 3278194, at *3.

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[REDACTED]

[REDACTED]

This case is not about wafer fabrication or what is on a wafer when it leaves a fab. Cafarella—the sole named inventor and self-alleged drafter of the asserted patent and the sole person behind RRA—confirmed that wafers and wafer fabrication have nothing to do with his patent:

Q: The '313 patent doesn't claim any method for fabrication of wafers, correct?

...

A: I think I can answer that one. It doesn't talk about fabrication at all.

Q And so the '313 patent doesn't claim a method for fabrication of dies, correct?

A Are we on the same planet here? Seriously. There's nothing in this patent – this is a patent about the design of an electronic system. It doesn't talk about how you build the widgets, what you build them out of or what kind of processing line you use. It could be discrete, it could be integrated, but that's not what this patent is about.

Dkt. 73-12 at 77:6–23; *see also* Murias Dep. at 129:15–21.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

RRA's theory that [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] He admitted, however, that he did not actually know that Richardson is more than 200 miles from Austin. Murias Dep. at 125:13-19.

Second, Murias speculates that [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Dkt. 73-1, ¶¶ 42–43 (emphasis added). Although Murias admitted during his deposition that there is actually “no way for [him] to tell” who [REDACTED]

[REDACTED]

[REDACTED] Murias Dep. at 123:2–10. Weinstein further confirmed that his and Murias’s statements [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Weinstein Dep. at 185:8–18. That speculation has no basis in reality. [REDACTED]

[REDACTED]. Ex. AA at ¶¶ 4-14.

[REDACTED]

[REDACTED] *Id.* at ¶¶ 5-6, 9, 11-13. [REDACTED]

[REDACTED] *Id.* at ¶ 8. [REDACTED]

[REDACTED] *Id.* at ¶¶ 8, 14. [REDACTED]

[REDACTED]

Id. at ¶¶ 15-16. To the extent Murias truly believes that testimony from [REDACTED] that favors transfer because the people who did that work for the accused products are Qualcomm employees outside of Texas (mostly in California). *Id.* at ¶¶ 10, 17-18

Because RRA and its expert's rationale for the relevance and knowledge [REDACTED] [REDACTED] [REDACTED] *DataQuill, Ltd. v. Apple Inc.*, No. A-13-CA-706-SS, 2014 WL 2722201 (W.D. Tex. June 13, 2014). Like *DataQuill*, this case is not about wafer fabrication [REDACTED] [REDACTED] [REDACTED]. 2014 WL 2722201, at *3 ("Although Samsung manufacturers [sic] chips for Apple in Austin, the manufacturing of those chips is not at issue in this case, and Samsung has not been sued."); *see also* Dkt. 74-9 at 17-18; Dkt. 73-5 at 137:8-138:17; Dkt. 71-11 at 16:6-15, 19:11-16, 52:22-53:6; Ex. G at Answers 1-4, 13-14; Ex. H at QCRRAMTT346_0000024; Ex. G. Even then, at most the end product ([REDACTED] [REDACTED]) is tangential to the core dispute regarding I-Q gain calibration. *DataQuill*, 2014 WL 2722201 at *3 n.3 ("However, the controller itself is at best tangential to the core dispute over how the iPhone uses software to interact with remote data sources."). The hardware-related limitations are generically recited and simply facilitate the alleged I-Q gain calibration invention.¹² *See* Dkt. 73-12 at 39:1-13, 67:20-25, 69:9-11, 68:12-24,

¹² [REDACTED]

68:25–69:2; 69:3–14, 69:16–19, 69:23–70:7, 70:8–10, 70:11–14, 70:15–71:2, 72:15–24, 72:25–73:2, 73:3–5, 73:6–8 (sole inventor admitting that he did not invent hardware elements, including “[t]ransceivers,” “processors,” “receive chains,” “phase shifters,” etc.); *see also DataQuill*, 2014 WL 2722201 at *3 (concluding that “the focus of the infringement story” is how the accused products operate rather than the limitations that simply facilitate that operation—e.g., the “controller,” the “memory”). Like the same arguments in *DataQuill*, RRA’s arguments regarding [REDACTED] should be rejected. *See also DataQuill*, 2014 WL 2722201 at *3 (evaluating infringement “requires information from Apple’s software and hardware engineers in Cupertino, not its third-party processor manufacturer in Austin”).

Further, if RRA’s allegations regarding the wafers produced [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Thus, for multiple reasons, [REDACTED]

[REDACTED]

Finally, RRA’s analysis completely ignores the actual factor at issue here, which is the availability of *compulsory process*. Instead, RRA discusses the “trial attendance cost.” Dkt. 73 at 7-8. RRA’s neglect of the true issue makes little sense, as even under RRA’s analysis, the average cost of attendance of Mohindra, Zhang, and [REDACTED] in each jurisdiction is comparable. Dkt. 73 at 7 (showing \$20 difference). Compulsory process can secure the attendance of two

[REDACTED]

potential witnesses identified by Defendants in NDCA, but only one potential witness RRA identifies in WDTX. Thus, even if [REDACTED] becomes a witness (which is unlikely), this factor still favors transfer.¹³

C. No Sources of Proof Are in WDTX

As with the location of witnesses, RRA also misrepresents un rebutted evidence confirming the ease of access to sources of proof in NDCA and the lack of relevant evidence repositories in WDTX. RRA raises rhetorical questions regarding the location of relevant Qualcomm technical and financial information, but the locations were identified in both a thorough interrogatory response and in the sworn declarations submitted with the opening brief. Dkt. 74-6 at 12–14; Dkt. 45-15 ¶ 23; Dkt. 45-16 ¶ 21. Contrary to RRA’s false assertions, [REDACTED] [REDACTED]. Dkt. 74-6 (Qualcomm’s Suppl. Resp. to Rog. 4) at 12–14 (“[REDACTED] [REDACTED]”), 12–13 ([REDACTED] [REDACTED]). Murias has already analyzed infringement based entirely on source code and schematics [REDACTED]. *See, e.g.*, Murias Dep. at 37:15–39:10. RRA identifies no other Qualcomm information—let alone information in Texas—that it needs. RRA’s remaining speculation that there might be relevant documents in WDTX is predicated on its demonstrably false allegations regarding WDTX witnesses and fail for the same reasons. *See* § II.A.2.b, *supra*. That failure is compounded by the evidence demonstrating that there are [REDACTED] and the fact that

¹³ RRA asserts that Defendants have not indicated that they would be inconvenienced by presenting Mohindra or Zhang by deposition designation. RRA has likewise not asserted that it would be inconvenienced by presenting [REDACTED] deposition designation.

[REDACTED] houses no relevant documentation. Dkt. 74-6 at 12-14; Ex. AA ¶¶ 4-18; *see* § II.B, *supra*.

Technical documents [REDACTED]

[REDACTED]
Dkt. 45-17 ¶ 7; Dkt. 74-3 at 13-16 (Resp. to ROG 4). The relevant non-technical documents [REDACTED] Dkt. 45-17 ¶ 11; Dkt. 74-3 at 13-16 (Resp. to ROG 4). For the same reasons that the employees identified by Murias and Weinstein are not relevant witnesses, they do not generate relevant documents in Texas. Although RRA argues that [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED] Because no relevant documents are created or stored in Texas, Apple will produce nothing from Texas.

RRA alleges that Rollins’s statement that there are no “unique working files or documents relevant to this case located in the WDTX” is an “implicit admission” that Apple has such documents. Dkt. 73 at 6. Not so. It is unreasonable to expect Apple to search its entire Texas facilities to see if anyone there happens to have a copy of a document relevant to this lawsuit. Rollins’s statement merely reflects the reality that such a search would be impossible in the time constraints of venue discovery for this case, and his care to swear to no more than he is certain of.¹⁴

¹⁴ RRA also alleges that there is something sinister about Rollins’s inability to describe the entire contents of Apple servers in NDCA. Opp. at 6. But, again, it is unreasonable for Apple to inventory the entire contents of all its servers for the purposes of venue discovery in this case. It is enough that none is located in Texas.

RRA's own evidence does not weigh against transfer. Documents housed at counsel's office are a proxy for choice of counsel—a consideration that has been resoundingly rejected in the transfer analysis. *See, e.g., Horseshoe*, 337 F.3d at 434; *see also Google*, 588 F. App'x at 991. Further, RRA's main attorneys (and the server its documents came from¹⁵) are not even in WDTX—they are in SDTX and EDTX.

In any event, the location of Defendants' documents is more important. *In re Nintendo Co.*, 589 F.3d 1194, 1199 (Fed. Cir. 2009) (“[I]n patent infringement cases, the bulk of the relevant evidence usually comes from the accused infringer. Consequently, the place where the defendant's documents are kept weighs in favor of transfer to that location.”). The burden on RRA to produce documents that have already been collected in a prior suit and are stored in a single repository already accessible to counsel is far less than the burden on Defendants to collect and produce documents from disparate sources in the first instance.

III. THE PUBLIC INTEREST FACTORS FAVOR TRANSFER

A. NDCA Has a Greater Local Interest in the Suit

The locus of investment and activity in the accused technology is in NDCA. NDCA is home to Apple and its relevant witnesses *and* the relevant Qualcomm [REDACTED]

[REDACTED]

[REDACTED]

As demonstrated above, none of the specific employees or generically identified groups in Texas are likely witnesses in this case. At best, RRA demonstrates only general corporate presence

¹⁵ RRA contends that all “47,985 pages” of documents they produced came from Texas “where they have resided for several years.” Dkt. 73 at 4. That is erroneous. The 47,985 pages of documents counsel cites includes (1) exports of public information from sites like LexMachina and LinkedIn, pulled by counsel in December 2021, (2) slip sheets saying only “Privileged Document,” and (3) attorney-created (litigation-related) documents.

in Texas that is not tied to the accused technology and products at the center of this case. *In re Apple Inc.*, 979 F.3d 1332, 1345 (Fed. Cir. 2020) (“This factor most notably regards not merely the parties’ significant connections to each forum writ large, but rather the significant connections between a particular venue and the events that gave rise to a suit.” (internal quotation marks omitted)).

The third-party [REDACTED] does not sway the outcome. This case has nothing to do with wafer fabrication and [REDACTED]. Section II.B, *supra*. Accordingly, a wafer fabrication site cannot constitute a significant connection between the venue and the events that give rise to the suit. *See DataQuill*, 2014 WL 2722201 at *3 (“the manufacturing of those chips is not at issue in this case”); *Juniper Networks*, 14 F.4th at 1320 (A “general presence in the Western District of Texas is not enough to establish a local interest in that district comparable to that of the Northern District of California” where events forming the basis for infringement allegations occurred). Further, RRA misrepresents [REDACTED]

[REDACTED] *See* n.12, *supra*. And given that [REDACTED]
[REDACTED]
[REDACTED] creates no other significant connection between the District and the events that give rise to this suit. *See In re Google LLC*, 855 F. App’x 767, 768 (Fed. Cir. 2021) (“Google’s mere presence in the Western District of Texas insofar as it is not tethered to the events underlying the litigation is not entitled to weight in analyzing the local interest factor in this case.”); *DataQuill*, 2014 WL 2722201 at *3 (“the manufacturing of those chips is not at issue in this case”).

Accordingly, the local interest factor weighs heavily in favor of the transferee forum.

B. The Court Congestion Factor Is Neutral

RRA’s cherry-picked time-to-trial data does not move the needle. The Federal Circuit has repeated that “the Western District of Texas and the Northern District of California show no

significant differences in caseload or time-to-trial statistics.” *Juniper Networks*, 14 F.4th at 1322; *Apple Inc.*, 979 F.3d at 1343 (“NDCA and WDTX have historically had comparable times to trial for civil cases”). RRA ignores the Federal Circuit’s key holding and attempts to muddy the analysis by omitting certain types of patent cases and failing to account for the fact that NDCA has 17 Article III judges compared to Waco’s one, and therefore can handle a much higher volume of trials for the foreseeable future. Dkt. 45 at 13–14; Dkt. 45-12 (WDTX and NDCA time-to-trial statistics). Nevertheless, the parties still agree that the difference in the time-to-trial is only 6-8 months, which is not significant. Dkt. 45 at 13 (NDCA is 6.6 months faster); Dkt. 73-2 ¶ 95-97 (WDTX is 8 months faster).¹⁶

Weinstein’s speculation regarding “opportunity costs” of transferring the case to NDCA fails for several reasons. First, RRA caused over 7.5 months of its own delay. RRA waited to file suit for five months after the first announcements that accused products were on sale (*see* Ex. I) and then extended transfer discovery, the Markman hearing, and ultimately the trial for another 2.5 months. RRA cannot now credibly claim that an alleged few month delay will cause it harm.

Further, Weinstein’s alleged losses to RRA as a result of the delay are irrelevant to this factor and not based on any reliable data. RRA and its expert cite no actual investment or other financial harm to RRA or even any past investment activity to give some credibility to the allegation. Dkt. 73 at 14–15. Weinstein uses a royalty rate allegedly from a prior case against Samsung but admitted that (1) he did not use the actual rate resulting from the Samsung case (Weinstein Dep. at 129:9–14; Ex. J (Sealed Order, *Red Rock Analytics, LLC v. Samsung Elecs.*

¹⁶ RRA includes a time-to-trial calculation made by its attorney Harris using a longer timeframe than its expert but does not appear to rely on Harris’s calculations, instead relying on its expert’s narrow dataset. *See* Dkt. 73 at 14-15. Taking Harris’s calculations as true indicates that the difference in time to trial between NDCA and WDTX is shrinking with time.

Co. Ltd., No:2:17-cv-00101-RSP, Dkt. 282 (E.D. Tex. Apr. 17, 2019)) and (2) he made no effort to evaluate whether that rate would apply in this case (Weinstein Dep. at 127:25-128:12, 148:14-149:2, 155:18-22, 157:23-158:2; 162:8-163:8). The rate is therefore wrong as a matter of law, rendering Weinstein’s conclusions improper. *See Exmark Mfg. Co. Inc. v. Briggs & Stratton Power Prod. Grp.*, LLC, 879 F.3d 1332, 1350 (Fed. Cir. 2018) (“When performing a *Georgia-Pacific* analysis, damages experts must not only analyze the applicable factors, but also carefully tie those factors to the proposed royalty rate.”). Compounding the problems with the calculation, the sole support for Weinstein’s loss assumptions (\$1 million for every \$10 million in damages) is his own paper, which is hardly reliable. Weinstein’s assertion that it would cost \$10 million more for the parties to litigate in NDCA than WDTX is based on an incorrect reading of an AIPLA 2021 survey. Dkt. 73-2, ¶ 107. AIPLA surveyed fees based on the “location of survey respondent,” not the court in which a given case was pending. Dkt. 73-2, Ex. 11. Finally, RRA and its experts’ opportunity costs argument is wedged under the “court congestion” *public* factor, but the alleged losses are only to Florida-based RRA. Dkt. 73 at 14–15.¹⁷

Because the time-to-trial differences are not significant, this factor is neutral. Regardless, it cannot outweigh the most important witness convenience factor, which strongly favors transfer. *In re Genentech, Inc.*, 566 F.3d 1338, 1343 (Fed. Cir. 2009) (noting importance of the convenience of witnesses factor); *Auto-Dril, Inc. v. Nat’l Oilwell Varco, L.P.*, No. 6:15-cv-00091, 2016 WL 6909479, at *7 (W.D. Tex. Jan. 28, 2016); *see* Section II.A, *supra*; Dkt. 45 at 6–7, 11–13.

IV. CONCLUSION

¹⁷ Recognizing the lack of analysis to the public interest factor, Weinstein tried to backtrack to argue that the cost is “to society,” but that is not what RRA’s Response contends. Dkt. 73 at 14–15. Also, Weinstein was unable to articulate how RRA’s theoretical investment losses impact the undefined “society.” Weinstein Dep. at 246:8–248:18.

Because the convenience of witnesses, compulsory process, ease of access to proof, and local interest factors weigh heavily in favor of transfer, the remaining factors are neutral, and RRA and its experts' arguments and opinions are contrary to the record and rely on unfounded conjecture, this case should be transferred to NDCA.

Dated: March 4, 2022

/s/ J. Stephen Ravel

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CERTIFICATE OF SERVICE

I hereby certify that all counsel of record are being served with a copy of the foregoing document via electronic mail on March 4, 2022.

/s/ J. Stephen Ravel

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CERTIFICATE OF SERVICE

I hereby certify that on this 19th day of March, 2025, I electronically filed the foregoing with the Clerk of the Court for the United States Court of Appeals for the Federal Circuit through the Court's CM/ECF system. I further certify that unless indicated otherwise, the foregoing was served via electronic mail upon the following:

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